PREPARED FOR:
The Gauteng Department of Agriculture and Rural Development

PREPARED BY:
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THE PROPOSED MOUNTAIN FUN PARK

On

Portion 38 of Olifantsvlei 327 IQ

GDARD REF NO: GAUT 002/21-22/E3020

MOUNTAIN FUN PARK (PTY) LTD

AquaStrat Solutions
Integrated Environmental Solutions

Draft Basic Assessment Report

June 2022

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Abbreviations

SCC	**Species of Conservation Concern**
TOPS	**Threatened or Protected Species**
EMPr	**Environmental Management Plan**
GDARD	**Gauteng Department of Agriculture and Rural Development**
CoJ	**City of Johannesburg**
IDP	**Integrated Development Plan**
SDF	**Spatial Development Framework**
SEI	**Site Ecological Importance**
CBA	**Critical Biodiversity Area**
ESA	**Ecological Support Area**

EXECUTIVE SUMMARY

Mountain Fun Park (Pty) Ltd is applying for Environmental Authorization for the proposed adrenalin-based adventure facility. The proposed park will include:

- Access Control and Parking site
- Luge tracks
- Upper and lower cable stations, cableway, launch site and viewing deck
- Restaurant, shop, ablution and management facilities
- Service road
- Viewing platform

A Luge ("small coasting sled") refers to a track built into the natural landscape on which visitors ride purpose-built sleds or toboggans.

The proposed Mountain Fun Park is situated on Portion 38 of Olifantsvlei 327 IQ, Gauteng Province. The application site consists of approximately 16 ha in total of which 4.4 ha consists of road reserve and delineation wetland, which will be excluded from development.

The site is located west of the Klipriversberg Nature Reserve and the majority of the site falls to the west of the R82 Vereeniging Road in the suburb known as Eagles Nest. The Afrisam Eikenhof quarry is situated directly west of the site.

The **sensitivities** of the site include:

- Critically Endangered Ecosystem: Klipriver Highveld Grassland
- Gauteng Critical Biodiversity Area: Irreplaceable to reach conservation targets
- Gauteng Ridges: Class 2
- Joburg Ecological Green Zone, Class 2 Ridge
- Vegetation
    - Species of Conservation Concern: Vulnerable plant species
    - TOPS vegetation: Pittosporum
- Fauna
    - site is not within a significant area of faunal endemism
    - Invertebrate SCCs: not confirmed but cannot be excluded - *Aloeides dentatis dentatis*; *Clonia uvarovi*; site outside the main *Lepidochrysops praeterita* habitat
    - TOPS invertebrates: TOP spider recorded - *Harpactira hamiltoni*
    - Vertebrate SCCs: none are likely to occur on site
    - TOPs vertebrates: not confirmed but cannot be excluded – hedgehog, Mountain Reedbuck, Secretary bird, Lanner Falcon, White-bellied Korhaan and Lesser Kestrel
- Heritage
    - Stone walls with 15m buffer
    - Potential grave situated in wetland area, excluded from development
- Aquatic
    - Channeled valley bottom wetland and 50m buffer fall outside of the proposed development, although within property boundaries, and on the opposite side of the R82 dual carriageway

The **goals** of this project are to provide an adrenalin-based tourism facility that facilitates multiple participants at a time, with supporting and ancillary facilities that provides financial viability, and to dedicate 89% of the land, including SCC populations and sensitive habitat, social and heritage features, to management for conservation by means of monitoring and adaptive management.

The project is deemed to be aligned with the Gauteng Provincial as well as Johannesburg spatial planning objectives and provides an opportunity for ecological management of a property of which the continuation of the status quo will undoubtedly lead to further degradation of the ecological resources on site.

The impacts of the construction phase of the proposed project are expected to be temporary and minimal, and can be managed effectively through mitigation measures as provided in the EMP. Mitigation of impacts during the operational phase include measures such as strict access, pedestrian movement control, limited number of visitors at the facilities on the ridge, as well as stormwater and waste management. An Ecological Management Plan will be developed for the property and will contribute to the improvement of vegetation cover and species composition by erosion control, alien invasive plant eradication and other specialist recommendations. Monitoring by an ECO during construction and operation as indicated by the EMPr for each aspect and its respective impacts.

GAUTENG PROVINCE
AGRICULTURE AND RURAL DEVELOPMENT
REPUBLIC OF SOUTH AFRICA

Basic Assessment Report in terms of the National Environmental Management Act, 1998 (Act No. 107 of 1998), as amended, and the Environmental Impact Assessment Regulations, 2014 (Version 1/2022)

Kindly note that:

1. This **Basic Assessment Report** is the standard report required by GDARD in terms of the EIA Regulations, 2014.
2. This template is current as of April 2022. It is the responsibility of the EAP to ascertain whether subsequent versions of the template have been published or produced by the competent authority.
3. A draft Basic Assessment Report must be submitted, for purposes of comments within a period of thirty (30) days, to all State Departments administering a law relating to a matter likely to be affected by the activity to be undertaken.
4. **A draft Basic Assessment Report must be submitted, for purposes of comments within a period of thirty (30) days, to a Competent Authority (uploaded to the EIA online system) empowered in terms of the National Environmental Management Act, 1998 (Act No. 107 of 1998), as amended to consider and decide on the application. The EIA online system can be accessed at https://eia.gauteng.gov.za.**
5.
6. **A copy (PDF) of the final report and attachments must be uploaded to the EIA online system. The EIA online system can be accessed at https://eia.gauteng.gov.za.**
7. **Draft and final reports submitted in terms of the National Environmental Management: Waste Act, 2008 (Act No. 59 of 2008) must be emailed to environmentsue@gauteng.gov.za.**
8. The report must be typed within the spaces provided in the form. The size of the spaces provided is not necessarily indicative of the amount of information to be provided. The report is in the form of a table that can extend itself as each space is filled with typing.
9. Selected boxes must be indicated by a cross and, when the form is completed electronically, must also be highlighted.
10. An incomplete report may lead to an application for environmental authorisation or Waste Management License being refused.
11. Any report that does not contain a titled and dated full colour large scale layout plan of the proposed activities including a coherent legend, overlain with the sensitivities found on site may lead to an application for environmental authorization or Waste Management License being refused.
12. The use of “not applicable” in the report must be done with circumspection because if it is used in respect of material information that is required by the competent authority for assessing the application, it may result in the application for environmental authorisation or Waste Management License being refused.
13. The applicant must fill in all relevant sections of this form. Incomplete applications will not be processed. The applicant will be notified of the missing information in the acknowledgement letter that will be sent within 10 days of receipt of the application.
14. Unless protected by law, and clearly indicated as such, all information filled in on this application will become public information on receipt by the competent authority. The applicant/EAP must provide any interested and affected party with the information contained in this application on request, during any stage of the application process.
15. Although pre-application meeting with the Competent Authority is optional, applicants are advised to have these meetings prior to submission of application to seek guidance from the Competent Authority.

DEPARTMENTAL DETAILS

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

Ground floor, Umnotho House, 56 Eloff Street, Johannesburg

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

(For official use only)

NEAS Reference Number:	
File Reference Number:	
Application Number:	
Date Received:	

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

Not Applicable.

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

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

The application is for the construction and operation of a luge track and ancillary facilities and does not relate to the decommissioning/closure of a facility.

Has a draft report for this application been submitted to a competent authority and all State Departments administering a law relating to a matter likely to be affected as a result of this activity? **Yes**

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

If no, state reasons for not attaching the list.

Not Applicable.

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

If no, why?

Section A: Activity information

1. PROPOSAL OR DEVELOPMENT DESCRIPTION

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

MOUNTAIN FUN PARK:

This Draft Basic Assessment Report is for the proposed Mountain Fun Park adrenalin-based tourism facility situated on Portion 38 of Olifantsvlei 327 IQ, Gauteng Province. The application site consists of approximately 16 ha in total, zoned as Residential 1, of which 4.4 ha consists of road reserve and delineation wetland, which will be excluded from development.

The study site is located west of the Klipriversberg Nature Reserve and the majority of the site falls to the west of the R82 Vereeniging Road in the suburb known as Eagles Nest. The Afrisam Eikenhof quarry is situated directly west of the site and Kibler Park is situated to the southeast of the site (Figure 1). Currently there is a single vehicle access point off the Vereeniging Road at Pierpont Drive. Beyond the site to the north is the main Afrisam Quarry access road whilst along the western boundary is the Quarry fence and a powerline. The high point is 1705m above sea level with a drop of 92,5m at a gradient of approximately 25 % to the lowest point of 1612,5m.

The proposed park will include:

- Access Control and Parking site
- Luge tracks
- Upper and lower cable stations, cableway, launch site and viewing deck
- Restaurant, shop, ablution and management facilities
- Service road
- Viewing platform

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A Luge ("small coasting sled") refers to a track built into the natural landscape on which visitors ride purpose-built sleds or toboggans. It is an adrenaline-based adventure activity.

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Activities being applied for in Listing Notice 1, GN 983 of 2014 as amended by GN 327 of 2017:

- Activity 27. The clearance of an area of 1 hectare or more, but less than 20 hectares of indigenous vegetation

Activities being applied for in Listing Notice 3, GN 985 of 2014 as amended by GN 327 of 2017:

- Activity 4. The development of a road wider than 4 metres with a reserve less than 13,5 metres
- Activity 5. The development of resorts, lodges, hotels, tourism or hospitality facilities that sleep less than 15 people.
- Activity 8. The development and related operation of above ground cableways and funiculars.
- Activity 9. The development and related operation of zip-lines or foefie-slides exceeding 100m in length.
- Activity 12. The clearance of an area of 300 square metres or more of indigenous vegetation
- (in) iv. Sites identified as Critical Biodiversity Areas (CBAs) or Ecological Support Areas (ESAs) in the Gauteng Conservation Plan or in bioregional plans.

A Water Use License is being applied for with the Department of Water and Sanitation and includes activities in terms of Section 21 of the National Water Act No. 36 of 1998:

(c) impeding or diverting a watercourse
(i) altering the watercourse characteristics

as read with GN 509 of 2016, according to which the Risk Assessment outcome was assessed to be Low.

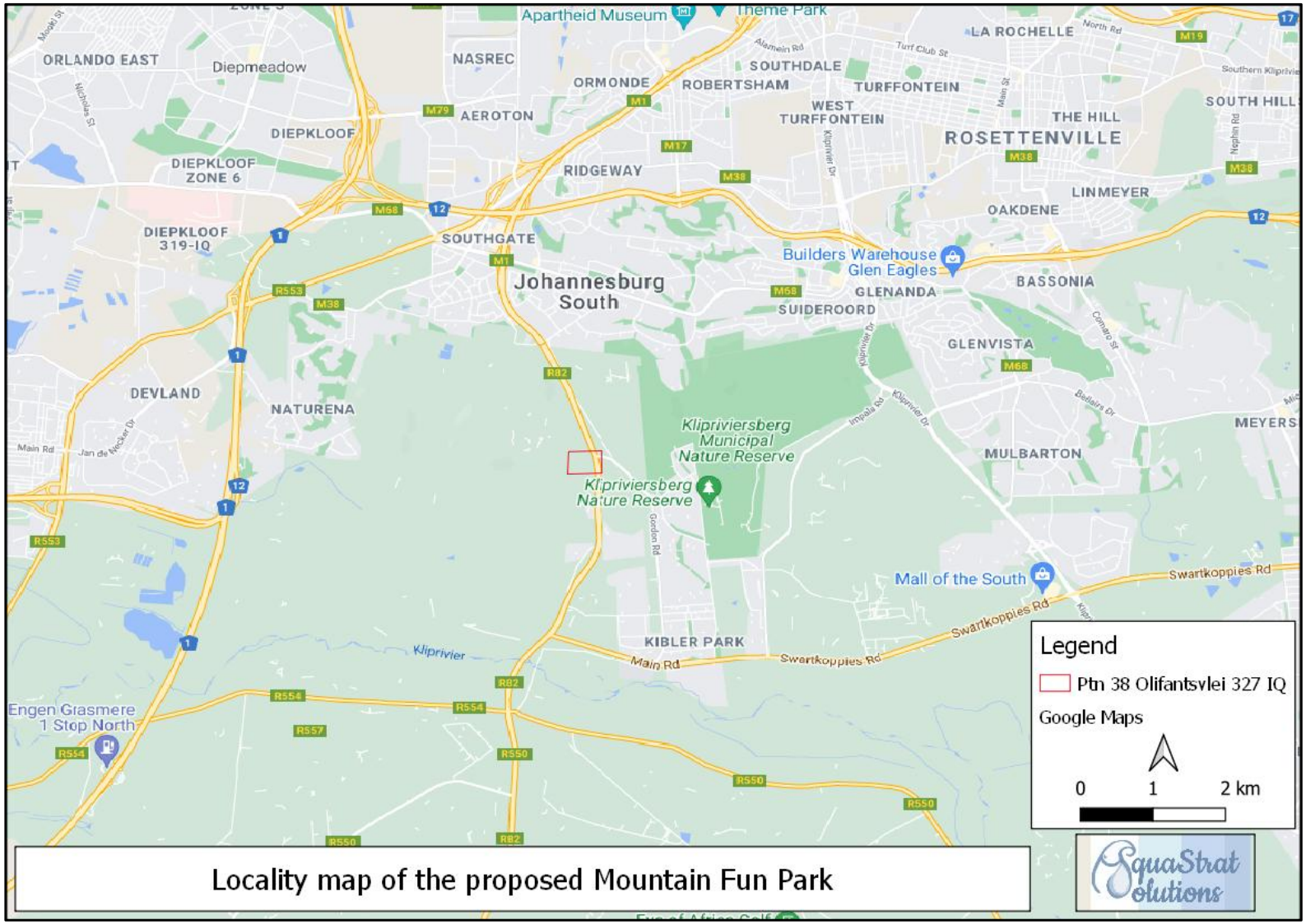


Figure 1: Locality Map.

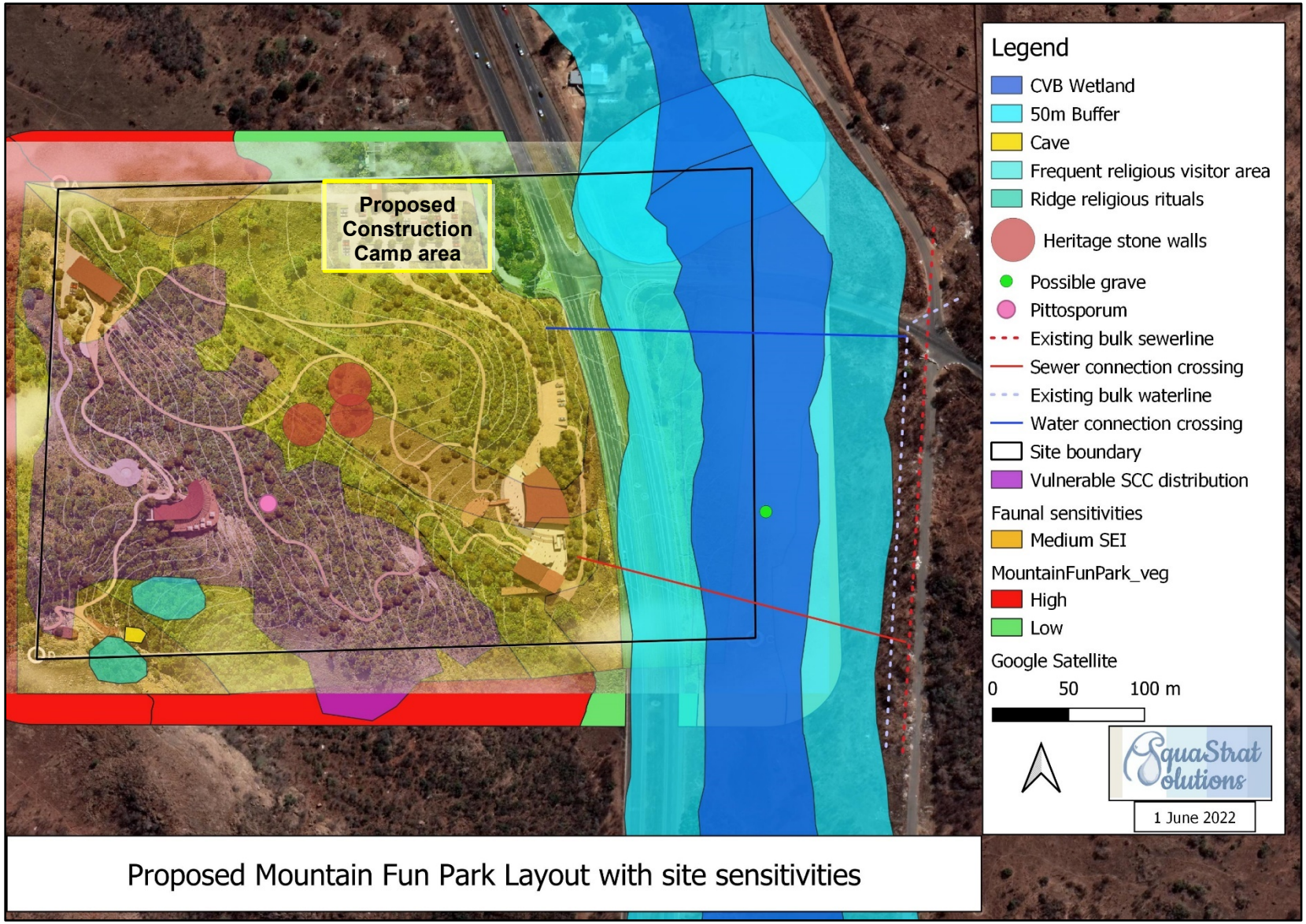


Figure 2: Layout of the proposed Mountain Fun Park showing all site sensitivities and proposed construction camp locality.

LUGE BACKGROUND

There are a number of Luge sites around the world and the following are located in **South Africa**:

- ❖ Misty Mountain in Mpumalanga,
- ❖ Cool Runnings Family Toboggan, Cape Town and
- ❖ Hartebeespoort Cable Way (not a Luge, but operates a cableway)

Other **international** Luge sites include:

- New Zealand: Queenstown & Rotorua Luge
- Canada: Skyline Luge Calgary
- Singapore: Skyline Luge Sentosa
- Philippines: Dahilayan Forest Park, Bukidnon
- China: Yanqing National Sliding Centre
- Korea: Skyline Luge Tongyeong and Alpensia Sliding Centre

Operation:
The lower cable station transports visitors and carts to the upper cable station from where the gravity-driven cart is launched. The rider controls the speed and direction during the downhill ride and experiences the view from the cable car.

Construction:
The tracks will be constructed as shuttered poured concrete similar to the concrete driveway of Eagle's Nest Estate to the south of the site.

The following **common features** which contribute towards their success are highlighted below as lessons to be considered for the development of the Mountain Luge Park include the following (adapted from GAPP Architects, 2022):

- ❖ The Luge experience is an adrenaline based, adventure activity for all age groups.
- ❖ Typical track design ranges from 700 to 800m in length with an elevation drop between 41 and 108 m.
- ❖ A key part of the experience is a way of appreciating the natural environment as the track and facilities are embedded in and respectful of its surroundings
- ❖ Alternatives to track design include monorail, steel-half pipe toboggan runs and concrete tracks.
- ❖ The monorail is easiest to construct as it essentially sits above ground, but only allows one participant at a time to ride.
- ❖ The steel half-pipe toboggan run also only allows one participant at a time, but is considered dangerous and often result in injuries.
- ❖ The concrete track allows for multiple users and therefore racing against each other is possible. It is however more complex and expensive to construct.
- ❖ Visitors are transported from the arrival point, which is typically the low point on the site to the upper starting point via a cable way that allows for views of the track below
- ❖ Successful luges offer a range of related activities such as viewing decks, cafes and restaurants, memorabilia and merchandise sales, children's playgrounds, etc as spinoffs and options to retain the visitor for longer.

The concrete track is the only alternative considered to be a feasible option for this specific proposed project, as it provides the opportunity for family and friends to participate together and it allows for over-taking, thereby avoiding the frustration of being stuck behind slower luge riders, as is often the case with the Monorail option.

Figure 3. Concrete track luge with tunnel (Skyline Queenstown, NZ website).

FOOTPRINT

Although 5% of property is recommended to be developed on Ridge Class 2 according to the GDARD Ridges guideline, and the proposed footprint is 11%, the ecological and conservation benefits of the ongoing management during the operational phase will contribute significantly to conservation of the ecological resources on site if compared to the No-go option of continued status quo. The additional footprint is required for the ancillary services in order to be financially viable.

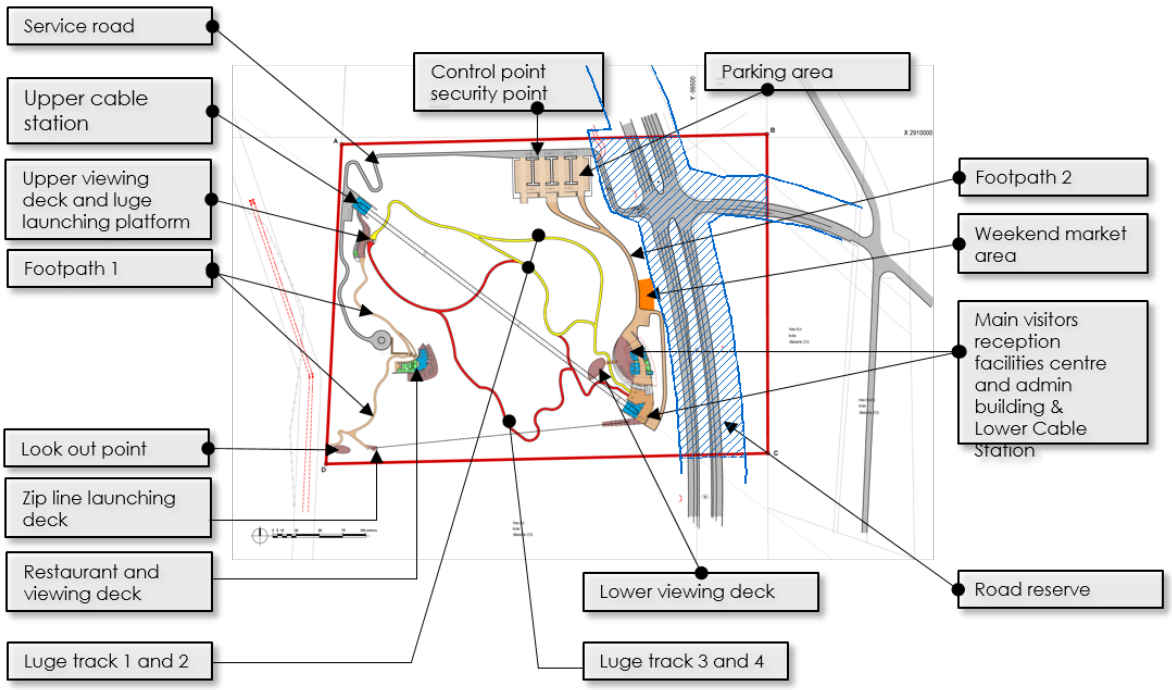


Figure 4. Footprint calculation reference map (GAPP, 2022) remove footpaths & zipline

1. New service road, footpaths and surface parking			% of Net Total Site Area	% of Site Area Coverage
Service road	2901	m²	15.8%	1.82%
Footpath 1	1014	m²	5.5%	0.63%
Footpath 2	1832	m²	10.0%	1.15%
Open surface parking area	3778	m²	20.5%	2.36%
Weekend open market and parking area	513	m²	2.8%	0.32%
Sub total 1	**10 039**	**m²**	**54.6%**	**6.3%**
2. Luge Tracks				
Luge Track 1 and 2	1585	m²	8.6%	0.99%
Luge Track 2 and 3	1574	m²	8.6%	0.98%
Sub total 2	**3 159**	**m²**	**17.2%**	**2.0%**
3. Decks and platforms				
Look out point deck	120	m²	0.7%	0.08%
Zip line launching pad	40	m²	0.2%	0.03%
Zip line landing pad	220	m²	1.2%	0.14%
Lower viewing deck	274	m²	1.5%	0.17%
Main visitors reception facilities deck and luge landing platfom	1 416	m²	7.7%	0.89%
Upper cable station viewing deck and luge launching platform	349	m²	1.9%	0.22%
Restaurant deck	519	m²	2.8%	0.32%
Sub total 3	**2 938**	**m²**	**16.0%**	**1.8%**
4.a. Buildings excluding decks				
Control point and security	6	m²	0.03%	0.004%
Main visitors reception facilities centre and ticket	908	m²	4.9%	0.57%
Lower cable station	401	m²	2.2%	0.25%
Upper cable station	416	m²	2.3%	0.26%
Restaurant	523	m²	2.8%	0.33%
Sub total 4	**2 254**	**m²**	**12.3%**	**1.4%**
Net Total Area	**18 390**	**m²**	**100%**	**11.5%**

The permeable parking will be vegetated and will have vegetated swales as illustrated below in the Stormwater Management section.

4.b. Parking Calculation		
-	m²	Not appliacable
266	m²	Area excludes toilets , circulation areas and services
223	m²	Area excludes circulation areas and services
216	m²	Area excludes circulation areas and services
203	m²	Area excludes toilets and kitchen
908	**m²**	
91	Parking bays required @ 10 bays per 100m²	
101	Parking bays provided on proposed site plan	

Remove footpaths

SERVICES BACKGROUND

Water

Currently there is an existing 160mm diameter municipal potable water main located on the eastern side of the R82. It is proposed to connect with a new 110mm diameter connection, by means of Horizontal Directional Drilling (HDD), on this exiting municipal supply pipe. The development will require a fire rational design at detail design stage with the necessary pumps and storage tanks provided on the site.

Peak Flow (Restaurant & Park)

- Average domestic flow = 2000m2 x 0,85 Kl/100m2 = 17kl/day = 0,19ℓ/s
- Peak domestic flow = 0,19ℓ/s x 1,5 x 4,0 = 1,18ℓ/s
- Fire hydrant= 25 ℓ/s (FH) + 2x0,5 ℓ/s (FHR) =26,0 ℓ/ FH
- Peak design flow = 1,18 ℓ/s + 26,0 ℓ/s = 27,18 ℓ/s

Sewer

Currently there is an existing 1370mm dia municipal sewer main located on the eastern side of the R82. It is proposed to connect to this existing municipal network pipe by installing a new 160mm sewer connection, by means of Horizontal Directional Drilling (HDD). See Annexure C for proposed sewer reticulation layout.

Peak Flow (Restaurant & Park)

Peak flow from the proposed development is calculated as follows:

- Average domestic flow = 2000m2 x 0,65 Kl/100m2 = 13kl/day = 0,15ℓ/s
- Peak domestic flow = 0,15ℓ/s x 1,15(SW) x 2,5 = 0,432/s (Redefined Consulting Engineering, 2022).

GEOTECHNICAL BACKGROUND

The site is underlain by localised fill, colluvium and residual soils derived from the weathering of the underlying basaltic lavas of the Klipriviersberg Group which is a subdivision of the larger Ventersdorp Supergroup. No groundwater was encountered in the test pits.

The soils are inferred to have a medium heave potential and the site has been classified according the NHBRC requirements which provide recommendations on foundations for various amounts of soil heave. However, from a bearing capacity point of view the soils are able to support foundations provided that foundation pressures are kept to less than 75 kN/m2. Where shallow rock occurs, this may be increased to 150 kN/m2.

One of the most important factors in the promotion of a stable site is the control and removal of surface water from the property. It is important that the design of the stormwater management system allows for the free drainage of accumulated surface water from any hardened areas, parking areas and the platform into the municipal stormwater system.

For foundations on the rocky slopes on the western portion of the site, foundation pressures of 300 kN/m2 may be adopted. It will be good practice to dowel any foundations cast directly onto the rock with 25 mm rebar installed at 0.75 m centres (Geozone, 2021).

STORMWATER MANAGEMENT

The preliminary stormwater layout plan addresses the impacts of the hardened surfaces by means of Sustainable Urban Drainage (SUDS) measures, including:

- Permeable vegetated parking
- Vegetated swales
- Erosion control at outlets

Post-developed runoff and attenuation

Infrastructure (restaurant, viewing deck, cable car landing area, visitor centre)

The runoff from these small developed areas (restaurant, viewing deck, cable car landing areas etc) will be directed by grid inlets(600mmx600mm) and a series of network pipes (250mm to 450mm) to flow towards the low points along the eastern side where it will then discharge in to planted swales with a soakaway system. The soakaways will discharge into the open veld area where it will naturally runoff towards the

boundary. The swales are strategically positioned to be naturally draining and fit in with the topography of the mountainous areas. The swales will have to constructed to align with the terrain and slope of the erf. Erosion control mechanisms such as gabion mattresses will be required at the outlets to manage erosion at swale and pipe outlets.
We don't recommend attenuation ponds due to the small post developed areas being isolated/sporadic throughout the park area, it is recommended to then attenuate the peak flows using SUDS methods rather with the preferred option of planted swales with a soakaway system. The soakaways will naturally discharge down the steep mountainous areas and towards the R82 Vereeniging Road.
The swales will comprise the construction of a stone filled trenches of dimension 1,2m deep x 1,5m wide with bidum layers and planted with vegetation and stone to match the natural environment.
The swales will provide an attenuation volume as follows:
Swale lengths positioned at strategic points throughout the fun park to discharge the peak flows from buildings and roads:

- Swales ± 130m long x 1,2m deep x 1,5m wide x 60%(Stone) = 140m³ of storage available

Main parking area
The main parking area will be discharged into a series of grid inlets (600mmx600mm) and then onto a 450mm dia stormwater pipe located at the lower east side of the parking area. This new 450mm network pipe will then run south towards the access road with Vereeniging Road at Pierpont Drive. The pipe will then discharge via culvert headwall with gabion erosion mattress onto the road reserve of the R82. There is an existing municipal pipe culvert crossing and stormwater system in Vereeniging Road (R82) which will then discharge the flows.

Post-development Flows
The post developed flows are shown below for the entire 16Ha site due to the fact that the post developed areas are very small and located at isolated areas of the fun park which don't result in concentrated flows. Flows Calculation based on a 30min storm duration (Redefined Consulting Engineering, 2022).

Return Period (years) tc=15min	Area (16Ha) Pre Dev Runoff (m^3/s)	Area (16Ha) Post Dev Runoff (m^3/s)	Diff between Pre and Post (m^3/s)	Attenuated Attenuation Flows (m^3/s)
5	0.84	0.945	0.15	± 0.85
25	1.36	1.53	0.17	± 1.4
50	1.66	1.87	0.19	± 1.7

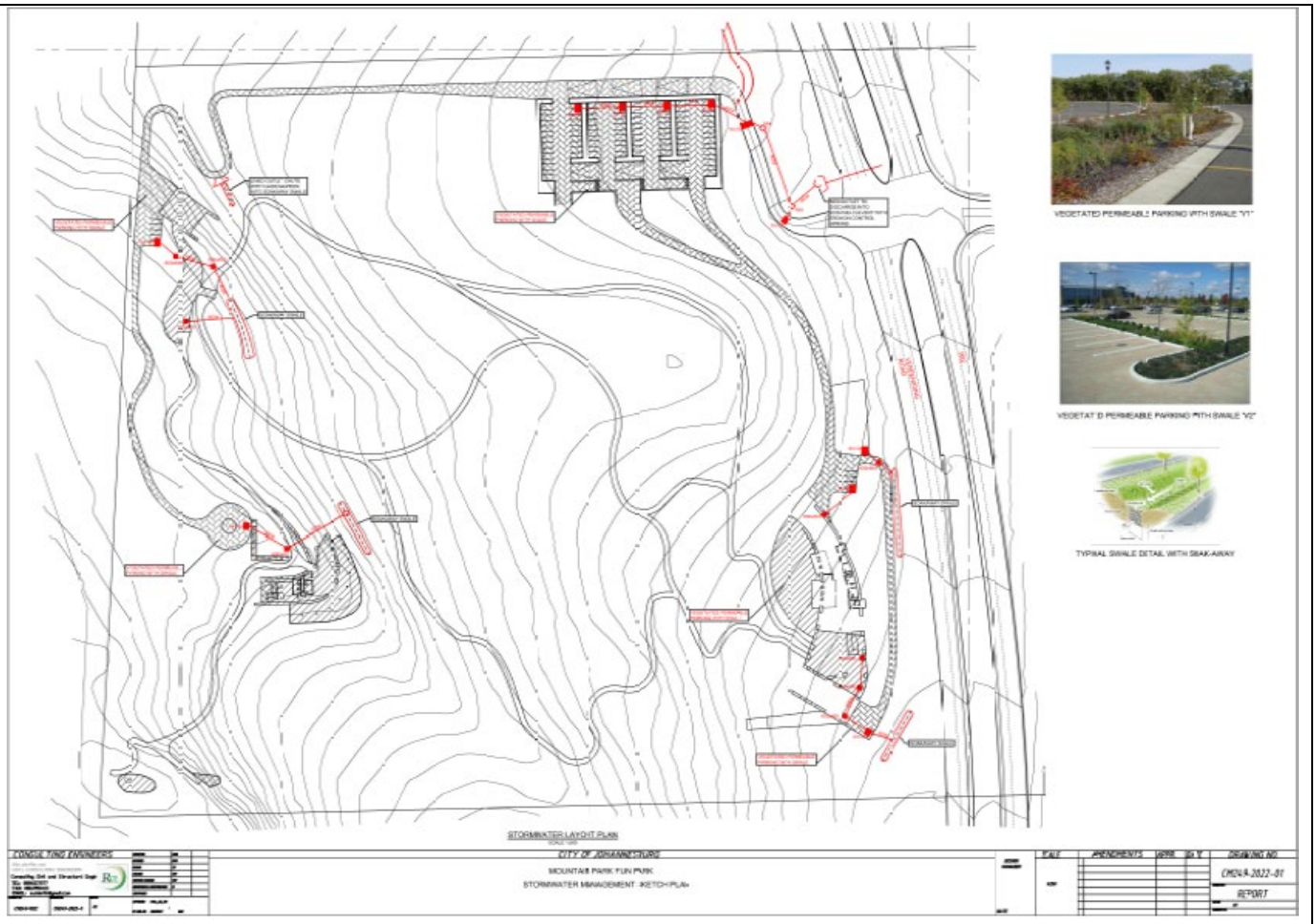


Figure 5. Stormwater layout plan with SUDS (Redefined Consulting Engineering, 2022)

Select the appropriate box

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

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

- National Water Act, 1998 (Act No. 36 of 1998)
  Department of Water and Sanitation (DWS)

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

2. APPLICABLE LEGISLATION, POLICIES AND/OR GUIDELINES

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

Title of legislation, policy or guideline:	Administering authority:	Promulgation Date:
Constitution of Southern Africa Act No. 108 of 1996	National	18 Dec 1996
National Environmental Management Act No. 107 of 1998 as amended.	National	27 Nov 1998

NEMA Environmental Impact Assessment (EIA) Regulations 2014, as amended in April 2017 (published in Government Notice No. R.326)	National	4 Dec 2014, amended 7 Apr 2018
Procedures for the Assessment and Minimum Criteria for Reporting on Identified Environmental Themes in terms of Sections 24(5)(a) and (h) and 44 of the National Environmental Management Act, 1998	National	20 Mar 2020
The National Water Act, 1998 (Act No. 36 of 1998)	National	26 Aug 1998
The National Water Act, 1998 (Act No. 36 of 1998) General Notice 509 - development within 500 meters of a wetland	National	26 Aug 2016
The National Water Act, 1998 (Act No. 36 of 1998) General Notice 276 – Regulations for Water Use Licence Applications and Appeals	National	24 Mar 2017
National Environmental Management Waste Act 59 of 2008	National	6 Mar 2009 amended 2 Jun 2014
National Environmental Management: Air Quality Act, 2004 (Act No. 39 of 2004)	National	19 Feb 2005, amended 19 May 2014
National Environmental Management: Protected Areas Act, 2003 (Act No. 57 of 2003)	National	1 Nov 2004 as amended to date 25 Feb 2016
National Environmental Management: Biodiversity Act, (Act No. 10 of 2004)	National	7 Jun 2004
Conservation of Agricultural Resources Act, 1983 (Act No. 43 of 1983), as amended	National	1 Jun 1984
Section 108 of the Town Planning and Townships Ordinance, 1986 (Ord. 15 of 1986).	National	18 Dec 1986
The South African Heritage Resources Act (SAHRA), 1999 (Act No. 25 of 1999) protects the cultural resources on a proposed development site.	National	14 Apr 1999
The Municipal Systems Act, 2000 (Act No. 32 of 2000) and the Integrated Development Plans (IDP)	National	20 Nov 2000
World Heritage Convention Act, 1999 (Act No. 49 of 1999);	National	9 Dec 1999
Protection of Personal Information Act, 2013	National	26 Nov 2013
Gauteng Noise Control Regulations (GN 5479 of 1999)	Provincial	20 Aug 1999
Gauteng Planning and Development Act, 2003 (Act No. 3 of 2003) (GPDA)	Provincial	14 Oct 2003
Gauteng Pollution Buffer Zone Guidelines, 2017	Provincial	March 2017
Gauteng Provincial Government (2020) Best Management Practices for Sustainable Drainage Systems	Provincial	14 Feb 2020
Gauteng Spatial Development Framework 2030	Provincial	12 May 2016
Gauteng Provincial Environmental Management Framework, GPEMF, 2015.	Provincial	2015
The Gauteng Draft Red Data Policy	Provincial	2001
GDARD Conservation Plan, Version 3.3	Provincial	Oct 2014
GDARD Requirements for Biodiversity Assessments (Version 3, 2014)	Provincial	Mar 2014
Gauteng Ridges Guideline, v.2019	Provincial	Apr 2001
Gauteng Agricultural Hubs Policy	Provincial	2006

(Draft) Johannesburg Spatial Development Framework (2021/22 update) 2040	Local	2021/22
Johannesburg Integrated Development Plan (IDP)	Local	2021/22
Environmental Sustainability Strategy and Action Plan for the City of Johannesburg	Local	2019
Johannesburg Growth and Development Strategy 2040	Local	2040
City of Johannesburg Metropolitan Municipality: Stormwater Management By-laws (No 181 of 2010)	Local	25 Oct 2010
Johannesburg Metropolitan Open Space Policy	Local	2002

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

Legislation, policy of guideline	Description of compliance
Constitution of Southern Africa Act No. 108 of 1996	The proposed activities entail the provision of an entertainment facility, as well as an environmental awareness amenity, which is in line with the provisions of the Constitution of Southern Africa of human dignity, the achievement of equality and the advancement of human rights and freedoms.
National Environmental Management Act No. 107 of 1998 as amended (NEMA).	Environmental Authorization applied for in terms of NEMA – Government Notice R 983 of 2014 (as amended by GN 327 of 2017) (Listing Notice 1): 27. The clearance of an area of 1 hectare or more, but less than 20 hectares of indigenous vegetation Government Notice R 985 of 2014 (as amended by GN 324 of 2017 (Listing Notice 3): 4. The development of a road wider than 4 metres with a reserve less than 13,5 metres 5. The development of resorts, lodges, hotels, tourism or hospitality facilities that sleep less than 15 people. 8. The development and related operation of above ground cableways and funiculars. 9. The development and related operation of zip-lines or foefie-slides exceeding 100m in length. 12. The clearance of an area of 300 square metres or more of indigenous vegetation (in) iv. Sites identified as Critical Biodiversity Areas (CBAs) or Ecological Support Areas (ESAs) in the Gauteng Conservation Plan or in bioregional plans.
The National Water Act, 1998 (Act No. 36 of 1998) (NWA)	A Water Use License is required in terms of Section 21 of NWA, as the proposed development is within 500m of a wetland.
The National Water Act, 1998 (Act No. 36 of 1998) General Notice 509 - development within 500 meters of a wetland	Development within 500 m of a wetland requires authorization and a WUL is applied for. An Aquatic Assessment was completed to delineate watercourses to determine the “regulated area” as defined by GN 509.
The National Water Act, 1998 (Act No. 36 of 1998) General Notice 267 of 2017 – WULA Regulations.	Regulations to be followed for the Water Use License Application.
National Environmental Management: Biodiversity Act, (Act No. 10 of 2004	The identification of important ecological features on site included Fauna and Vegetation Assessments and

	specialist recommendations were incorporated in the preferred alternative layout. The site falls in the Klipriver Highveld Grassland, a critically endangered ecosystem.
Procedures for the Assessment and Minimum Criteria for Reporting on Identified Environmental Themes in terms of Sections 24(5)(a) and (h) and 44 of the National Environmental Management Act, 1998	Procedures and criteria were implemented for the fauna and vegetation assessments. Species of conservation concern were identified and the recommended mitigation measures are incorporated in the layout and EMPr.
Conservation of Agricultural Resources Act, 1983 (Act No. 43 of 1983)	Erosion control and alien invasive plant control measures are included in the EMPr for construction and operational phases.
The South African Heritage Resources Act (SAHRA), 1999 (Act No. 25 of 1999) protects the cultural resources on a proposed development site.	A Heritage Impact Assessment was done and specified areas with 15m buffers are excluded from the proposed development.
Gauteng Provincial Environmental Management Framework (GPEMF), 2015.	Identification of zones where activities are controlled or exempt from certain listed activities. The site falls in Zone 3, which is a "high control zone outside urban development zone" and is indicated to be conditionally compatible with developments or land uses including: holiday resorts, camps, lodges, cottage hospitality, hospitality industry and conservation.
Gauteng Agricultural Hubs Policy	Determination of the agricultural potential of the proposed site is not considered relevant, as the slope and ridges, and vegetation sensitivities on site renders it unsuitable for agricultural use.
Gauteng Pollution Buffer Zone Guidelines, 2017	Site falls in zone 3: "high control zone outside urban development zone", which is indicated to be conditionally compatible with developments or land uses including: holiday resorts, camps, lodges, cottage hospitality, hospitality industry and conservation. Confirmed that the edge of the closest dump rock stockpile is 280m from the nearest site boundary, and confirmed with AfriSam Eikenhof that the property is outside the Blast Rock zone.
The Gauteng Draft Red Data Policy	Identification of Red Data species was done by means of the fauna and vegetation specialist assessments. Vegetation sensitivities were identified, the layout amended to intercept as few individuals of the vulnerable plant and other protected species, and recommended mitigation measures are incorporated in the EMPr.
GDARD Conservation Plan, Version 3.3	Site falls in CBA: Irreplaceable for reaching conservation goals of the Province. Identification of biodiversity areas and determining the sensitivity thereof was done by means of the fauna and vegetation specialist studies. Vegetation sensitivities were identified and recommended mitigation measures are incorporated in the layout and EMPr.
Gauteng Ridges Guidelines, 2019	**Footprint:** Site falls in a Class 2 ridge and proposed operational footprint = 11% of developable property; guideline recommends 5% ecological footprint. Although 5% of property is recommended to be developed on Ridge Class 2, the ecological and conservation benefits of the ongoing management during the operational phase will contribute significantly if compared to the No-go option of continued status quo. The additional footprint is

	required for the ancillary services in order to be financially viable **Land use:** Proposed activities align with guideline recommended activities, i.e., low impact tourism facilities.
GDARD Requirements for Biodiversity Assessments (Version 3, 2014)	Identification of biodiversity areas and determining the sensitivity thereof: applied in fauna and vegetation assessments.
Gauteng Provincial Government (2020) Best Management Practices for Sustainable Drainage Systems	SUDS principles are implemented in stormwater management: permeable parking area, swales and erosion control.
(Draft) Johannesburg Spatial Development Framework (2021/22 update) 2040	The site falls in the C-plan critical biodiversity area that "must be protected and preserved; with the value of ecosystem services they provide maximised. They should form part of the public realm, adding value and structuring elements to the urban system and provide agricultural, tourism, social and spiritual services. The proposed project is in line with these goals. Site falls in the "Area beyond UBD" development zone of the Draft SDF 2021/22. The SDF states "the natural structure should be seen as an irreplaceable city asset that provides valuable ecosystem services and not merely as unused land available for development. Protecting these areas is not done for the sake of conservation alone, but to make surrounding developed parts of the city more sustainable, liveable and valuable (socially, financially and in terms of green infrastructure)". This goal is accomplished by allocating 89% of the property to ecological management as stipulated in the Ecological Management Plan, to be drawn up prior to construction. This plan, in combination with the EMP, contributes positively to the SDF goals for: - resilience within communities; - compact carbon efficient urban development; and - preserving the natural environment that provides irreplaceable ecosystem services for the city
Johannesburg Integrated Development Plan (IDP)	Site falls in the Joburg Special Control Zone of the 2020/21 IDP with the following goals: **Waste Management:** this program aims to reduce environmental pollution, water and soil contamination, gas, odour, and potential fire hazards as a result of burning of solid waste. The proposed development will contribute positively to this goal. **Education:** The Environmental Entity in the Co-production of Basic Services, is earmarked to "educate communities about the importance of living in healthy environments". The proposed project links with this goal by means of the environmental education info at the visitor center. **Tourism Development** is indicated as supporting function to "Ensure and **monitor compliance** with appropriate environmental and heritage management legislation in respect to tourism development and operations", which is addressed by the EMPr and

	Ecological Management Plan monitoring, auditing and reporting requirements. The impact of **COVID 19** is discussed in the IDP and actions include "providing **stimulus** and accelerating recovery", under which "mainstream environmental sustainability" is listed as a guiding principle. **Sustainable Environment Development** is also listed as a strategic priority in the IDP. The proposed development fulfills this goal – refer to operational phase impacts in Section E of this report. **Resilience:** as part of creating integrated living spaces, the goal is to protect the open space system as a buffer and to protect biodiversity and green infrastructure. Environmental degradation is listed as a Top Strategic Risk of CoJ and the proposed project will achieve this on site by means of access control, EMPr and Ecological Management Plan measures.
City of Johannesburg Metropolitan Municipality: Stormwater Management By-laws (No 181 of 2010)	SUDS principles are implemented in stormwater management: permeable parking area, swales and erosion control.
Johannesburg Growth and Development Strategy 2040	Outcome 2 of the GDS: Provide a resilient, liveable, sustainable urban environment – underpinned by infrastructure supportive of a low-carbon economy. The GDS refers to resilience, sustainability and liveability as being about "Johannesburg's ability to manage its resource scarcity, ensuring that decisions and actions hold the least harm for the environment, while delivering on a realistic set of service responsibilities". The proposed project is considered resilient and sustainable due to the small footprint, proposed management of ecological no-go area and low energy use.
Environmental Sustainability Strategy and Action Plan for the City of Johannesburg, 2019	The proposed project will contribute towards curbing the loss of biodiversity, identified as a key Environmental Sustainability issue for CoJ. The proposed project will also contribute to managing valuable ecological resources that are under increasing pressure and are not adequately valued, protected or managed. The sustainable management of urban drainage to reduce damage to receiving environment and improved water quality, as part of Objectives 4 and 5 of the ESS, will be achieved on site with SUDS in the SWMP. Improved environmental awareness and accountability is also proposed as part of the functions of the facility by means of environmental education info at the visitor center.
Johannesburg Metropolitan Open Space Policy, 2004	The eradication of alien and invasive species on site will contribute to the CoJ open space principles. Conservation value of ecosystems on site was confirmed by means of Red data species and Listed Ecosystem identification, the conservation of which will contribute to the CoJ open space principles of determining priority areas for conservation. Other aspects of the site that

	provide a positive contribution to the Open Space Policy include: • environmental education/awareness • access control • pollution and degradation control • waste management • protection of heritage resources • Ecological Management Plan for the site
Protection of Personal Information Act, 2013	The protection of personal information during the public participation process is implemented by obtaining permission from Interested & Affected Parties for obtaining, storing and distributing specified information for purposes of registering Issues and Concerns.

3. ALTERNATIVES

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

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

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

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

The following alternatives were considered for the Mountain Fun Park project:

The **site locality** has no alternatives for the following reasons:
- Topography (slope) requirements for successful luge track.
- Large population in the area to visit the facility
- Access from an existing main road
- Applicant is the property owner and will be responsible for long-term management during operation
- Applicant has searched for this property for the last 10 years prior to purchase: one of the main goals of the project is to incorporate the structures and facilities as closely as possible to the natural environment in order to contribute to conservation in addition to providing an adrenalin-based tourism facility.

Technology alternatives:
The concrete track is the only technology alternative considered to be a feasible option for this specific proposed project, as it will allow for
- individual riders to determine their own speed and overtake,
- multiple riders to go at the same time; families and friends can also ride together.

Layout alternatives
The proposed layout (preferred alternative, attached as Appendix A) was amended to include the site sensitivities and avoids the majority of the SCC plants located on site. A few individuals will be relocated on site within the range of the nearest clump of the population. Exact numbers and localities of the individuals to be moved must be verified by means of a pre-construction site walk conducted by the vegetation specialist responsible for the assessment and a SANBI representative.

No-go alternative

Should the property be left undeveloped and the areas earmarked for active ecological management and monitoring not be managed and monitored, the current status quo will most likely lead to:

- Continued harvesting of the SCC (as witnessed and reported to SANBI and GDARD in Feb 2022)
- Continued uncontrolled fires
- No protection of heritage resources on site
- Alien invasive vegetation spread
- Continued vegetation structure change, increasing pressure on SCC
- No erosion control
- No litter control
- No adaptive management from monitoring outcomes
- No environmental education opportunities

Preferred option

The preferred option is to construct the Mountain Fun Park with luge tracks, upper- and lower cable stations, viewing deck, restaurant, visitor centre, curio shop, parking and associated infrastructure as indicated by the Masterplan (GAPP, 2022). The specialist mitigation measures included in the EMPr is strictly implemented, monitored and audited during the construction and operational phases and the ecological management areas are managed and monitored as indicated in the EMPr and Ecological Management Plan.

SUMMARY OF THE ALTERNATIVES

ALTERNATIVE	ASSESSMENT
No-go option	**Advantages:** o Uncontrolled open space function of site will prevail and continue o No temporary construction impacts **Disadvantages:** o Continued harvesting of the SCC (as witnessed and reported to SANBI and GDARD in Feb 2022) o Continued uncontrolled fires o No protection of heritage resources on site o Alien invasive vegetation spread o Continued vegetation structure change, increasing pressure on SCC o No erosion control o No litter control o No adaptive management from monitoring outcomes o No environmental education opportunities
Layout 1: no sensitivities considered	**Advantages:** o No harvesting of the SCC on site (fencing, access control and boundary patrol) o Managed fires and firebreaks o Protection of heritage resources o Alien invasive vegetation control o Monitoring for vegetation structure change o Adaptive management from monitoring outcomes o Erosion control o Litter control o Environmental education at visitor centre. o Area managed for ecological value by private investor, measures enforced by means of EA, EMPr and WUL. o .

	Disadvantages: ○ Construction and operation impacts on sensitivities are higher than the amended layout as more Vulnerable SCC plants are intercepted ○ Enclosing the site will prevent movement of certain fauna.
Preferred Alternative: Layout 2 - all sensitivities incorporated	**Advantages:** ○ No harvesting of the SCC on site (fencing, access control and boundary patrol) ○ Managed fires and firebreaks ○ Protection of heritage resources ○ Alien invasive vegetation control ○ Monitoring for vegetation structure change ○ Adaptive management from monitoring outcomes ○ Erosion control ○ Litter control ○ Environmental education at visitor centre. ○ Area managed for ecological value by private investor, measures enforced by means of EA, EMPr and WUL. **Disadvantages:** ○ Construction impacts on vegetation ○ Potential loss of individual plants during relocation on site ○ Enclosing the site will prevent movement of certain fauna.

This study therefore **recommends that the preferred alternative be instituted**, as the **benefits to conservation goals** include:

- management of the property for ecological functioning
- access control and security measures will prevent the harvesting of the SCC on site
- will contribute to the continued existence and improvement of the current vegetation cover and composition
- will maintain and improve the existing habitat
- will provide a valuable environmental education amenity
- will protect heritage resources on site
- will have a low impact on services including water, sewer and electricity
- will provide a sustainable, integrated tourism facility that stimulates economic activity, and manages and protects the ecological resources on site.

Provide a description of the alternatives considered

No.	**Alternative type**, either alternative: site on property, properties, activity, design, technology, energy, operational or other(provide details of "other")	**Description**
1	Proposal (Preferred Option)	Mountain Fun Park with luge tracks, upper- and lower cable stations, viewing deck, restaurant, visitor centre, curio shop, parking and associated infrastructure.
2	Alternative 1	Layout 1 (no incorporation of sensitivities)
3	Alternative 2	None available

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

The following aspects were considered during the investigation of alternatives, however are not included as alternatives, as the options below are not considered viable. Reasons are provided for not including these options as alternatives.

Technology options investigated:
Alternatives to track design include monorail, steel-half pipe toboggan runs and concrete tracks.

- The **monorail** is easiest to construct as it essentially sits above ground with minimal disruptions to the soil and vegetation but only allows one participant at a time to ride. The monorail does not allow multiple participants at a time and participants' individual speed control affects other participants' experience. This option is not considered financially viable for this specific facility due to the participant limitations.
- Advantages:
  - Low track installation impact on soil and vegetation
  - Small track footprint
- Disadvantages:
  - Limited to 1 participant at a time; no family or friends participating at the same time.
  - Frustration of slower participants and not being able to overtake; Monorail experience may discourage visitors from returning

Figure 6. Monorail option (GAPP, 2022)

- The **steel half-pipe** toboggan run also only allows one participant at a time and is reported to experience numerous accidents (ex. on Cape Town and NZ tracks), to the extent that the NZ luge track replaced the half-pipe with a concrete track. The high risk to the safety of participants excludes this option as an alternative.
- Advantages:
  - Low volume of concrete used with installation of tracks
- Disadvantages:
  - Dangerous to participants
  - Limited to 1 participant at a time; no family or friends participating at the same time.
  - Frustration of slower participants and not being able to overtake
  - Movement of small mammals across the track is limited

Figure 7. Steel half-pipe luge (GAPP, 2022)

- The **concrete track** allows for multiple users and therefore racing against each other is possible. It is however more complex and expensive to construct.
- The long-term success and volume of Skyline Skyrides in New Zealand, Canada and Singapore have shown that the concrete track is the best option for a mass market, safe and fun product.
- Advantage:
  - Overtaking is possible and the individual participant can determine his/her own speed more independently of other participants
  - More than one participant per cart and at a time allows for competitive participation
  - Achieves the main adrenalin-based activity goal, the element of excitement, achieved by having individual speed control and allowing competitive participation.
- Disadvantage:
  - Track installation impact is higher than the monorail
  - Larger footprint: total coverage of 2% of entire site

Figure 8. Concrete track luge (GAPP, 2022)

4. PHYSICAL SIZE OF THE ACTIVITY

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

	Size of the activity:
Proposed activity ***(Total environmental (landscaping, parking, etc.) and the building footprint)***	16 ha (18 390 m2)
Alternatives:	
Alternative 1 (if any)	16 ha (18 390 m2)
Alternative 2 (if any)	N/A
	Ha/ m^2

or, for linear activities: Not Applicable

	Length of the activity:
Proposed activity	Not Applicable
Alternatives:	
Alternative 1 (if any)	Not Applicable
Alternative 2 (if any)	Not Applicable
	m/km

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

	Size of the site/servitude:
Proposed activity	16 ha
Alternatives:	
Alternative 1 (if any)	16 ha
Alternative 2 (if any)	N/A
	Ha/m^2

5. SITE ACCESS

Proposal

	YES	NO
Does ready access to the site exist, or is access directly from an existing road?	x	
If NO, what is the distance over which a new access road will be built	Access from the R82 at Pierpont Drive	

Describe the type of access road planned:

Access from the R82 at Pierpont Drive.

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

Alternative 1

	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		

Describe the type of access road planned:

Same as above

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

Alternative 2

	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		

Describe the type of access road planned:

N/A

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

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

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

(only complete when applicable)

6. LAYOUT OR ROUTE PLAN

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

- the layout plan is printed in colour and is overlaid with a sensitivity map (if applicable);
- layout plan is of acceptable paper size and scale, e.g.
  - A4 size for activities with development footprint of 10sqm to 5 hectares;
  - A3 size for activities with development footprint of > 5 hectares to 20 hectares;
  - A2 size for activities with development footprint of >20 hectares to 50 hectares);
  - A1 size for activities with development footprint of >50 hectares);

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

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

- the scale of locality map must be at least 1:50 000. For linear activities of more than 25 kilometres, a smaller scale e.g. 1:250 000 can be used. The scale must be indicated on the map;
- the locality map and all other maps must be in colour;
- locality map must show property boundaries and numbers within 100m of the site, and for poultry and/or piggery, locality map must show properties within 500m and prevailing or predominant wind direction;
- for gentle slopes the 1m contour intervals must be indicated on the map and whenever the slope of the site exceeds 1:10, the 500mm contours must be indicated on the map;
- areas with indigenous vegetation (even if it is degraded or infested with alien species);
- locality map must show exact position of development site or sites;
- locality map showing and identifying (if possible) public and access roads; and
- the current land use as well as the land use zoning of each of the properties adjoining the site or sites.

7. SITE PHOTOGRAPHS

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

8. FACILITY ILLUSTRATION

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

Figure 9: Masterplan illustration (GAPP, 2022)

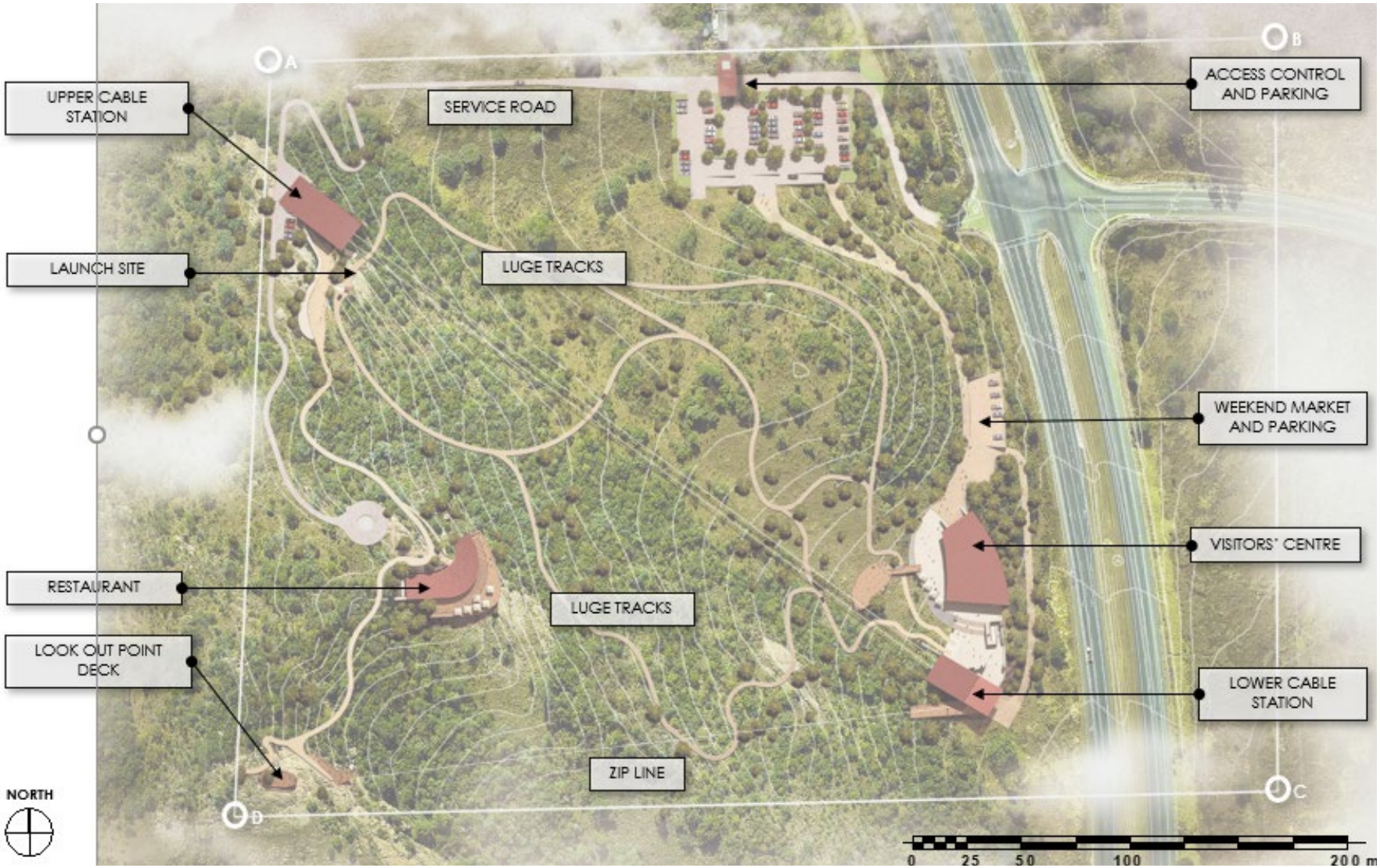


Figure 10: Masterplan illustration (GAPP, 2022)

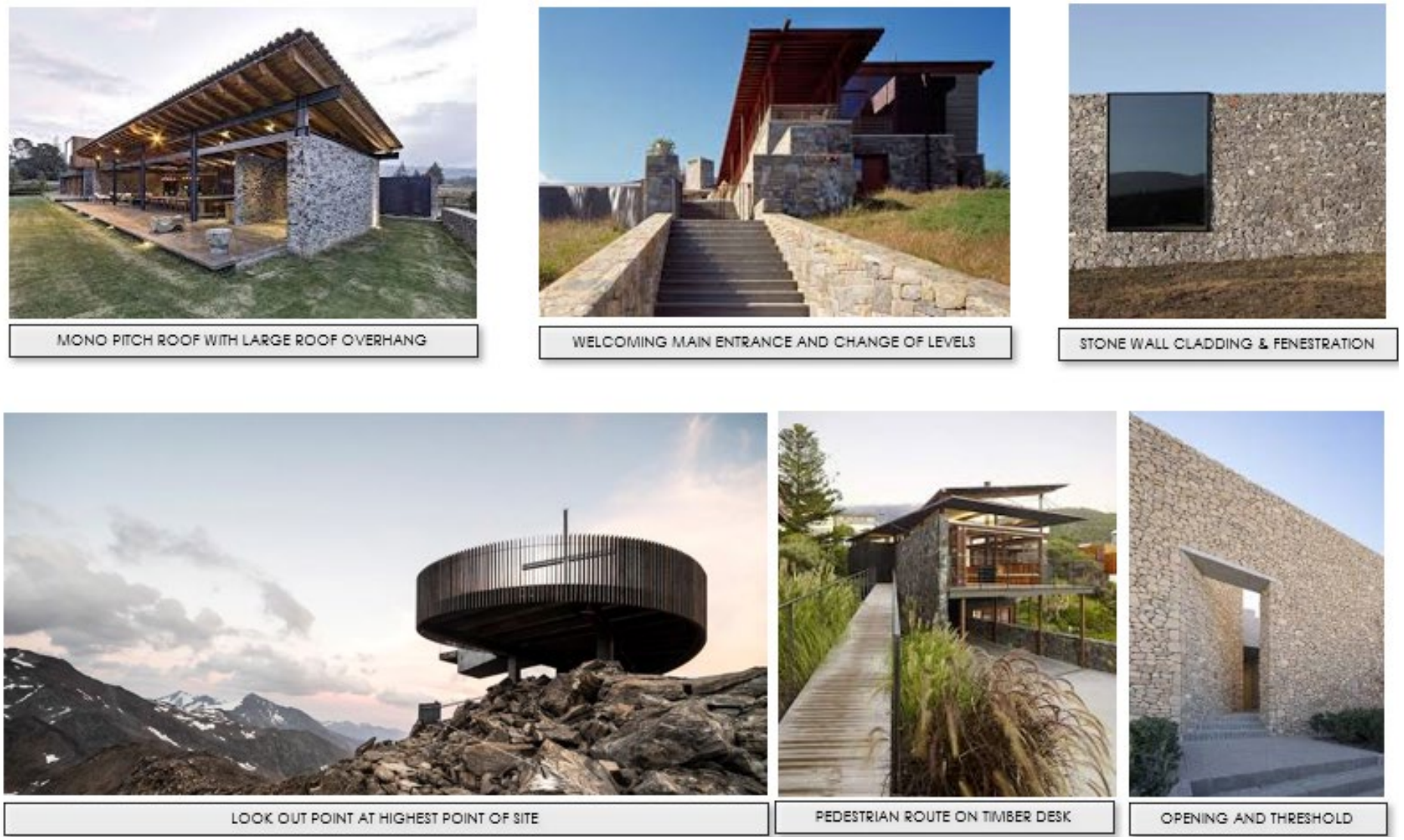


Figure 11: Architectural character of the proposed structures

Figure 12: Landscaping and street furniture

Figure 13: View of the proposed upper cable station & restaurant

Figure 14: Visual representation of the proposed Mountain Fun Park as would be seen from the east looking west (GAPP, 2022).

SECTION B: DESCRIPTION OF RECEIVING ENVIRONMENT

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

Instructions for completion of Section B for linear activities

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

Section B has been duplicated for sections of the route **Not Applicable** times

Instructions for completion of Section B for location/route alternatives

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

Section B has been duplicated for location/route alternatives **Not Applicable** 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: (Including Physical Address and Farm name, portion etc.)

Portion 38 of Olifantsvlei 327 IQ

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: Proposal, Alternative 1 and Alternative 2	**Latitude (S):**	**Longitude (E):**
	-26.297633°	**27.994717°**

In the case of linear activities: Not applicable

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

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

Addendum of route alternatives attached ☐

The 21 digit Surveyor General code of each cadastral land parcel

PROPOSAL	T	0	I	Q	0	0	0	0	0	0	0	0	0	3	2	7	0	0	0	0	0

3. GRADIENT OF THE SITE

Indicate the general gradient of the site.

Flat (1:60)	1:50 – 1:20	1:20 – 1:15	1:15 – 1:10	1:10 – 1:7,5 **X**	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 **X**	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 X**
Dolomite, sinkhole or doline areas	YES	**NO x**
Seasonally wet soils (often close to water bodies)	**YES X**	NO
Unstable rocky slopes or steep slopes with loose soil	**YES X**	NO
Dispersive soils (soils that dissolve in water)	YES	**NO X**
Soils with high clay content (clay fraction more than 40%)	**YES X**	NO
Any other unstable soil or geological feature	YES	**NO X**
An area sensitive to erosion	YES	**NO X**

(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 X** | 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):**
26°17'56.63"S	27°59'35.47"E

c) are any caves located within a 300m radius of the site(s) — YES | **NO X**

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):**
°	°

d) are any sinkholes located within a 300m radius of the site(s) — YES | **NO X**

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):**
°	°

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

6. AGRICULTURE

Does the site have high potential agriculture as contemplated in the Gauteng Agricultural Potential Atlas (GAPA 4)? — YES | **NO X**

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

7. GROUNDCOVER

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

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

Natural veld - good condition % =	**Natural veld with scattered aliens % = 70**	**Natural veld with heavy alien infestation % = 25**	Veld dominated by alien species % =	Landscaped (vegetation) % =
Sport field % =	Cultivated land % =	Paved surface (hard landscaping) % =	**Building or other structure % = 5**	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 X**	NO

If YES, specify and explain:

A large population of a Vulnerable SCC plant was found on site

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 X**	NO

If YES, specify and explain:

The SCC population found on site extends beyond the boundaries of the site

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

If YES, specify and explain:

Unchannelled valley bottom wetland on eastern side of the R82
Situated in CBA: irreplaceable and "Important" for conservation targets
Situated on Class 2 Ridge
Situated within Critically Endangered Klipriver Highveld Grassland

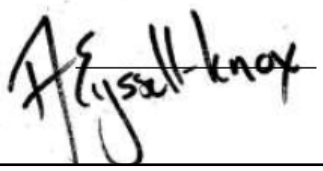
Was a specialist consulted to assist with completing this section	**YES x**	NO

If yes complete specialist details

Name of the specialist:	Antoinette Eyssell Knox		
Qualification(s) of the specialist:	MSc Environment		
Postal address:	PO Box 6314, Pretoria		
Postal code:	0001		
Telephone:	0836426295	Cell:	0836426295
E-mail:	Antoinette@dimela-eco.co.za	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: 28 April 2022

If yes complete specialist details

Name of the specialist:	BARBARA KASL		
Qualification(s) of the specialist:	PhD ANIMAL PLANT & ENVIRONMENTAL SCIENCES		
Postal address:	49 EAGLE TERRACE, APPLE STREET, HONEYDEW		
Postal code:	2194		
Telephone:	076 902 4464	Cell:	-
E-mail:	BK.ZOOLOGY@GMAIL.COM	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: 29 APRIL 2022

If yes complete specialist details

Name of the specialist:	Kieren Jayne Bremner Dunne		
Qualification(s) of the specialist:	MSc Aquatic Health		
Postal address:	22 4th Avenue, Linden, Johannesburg		
Postal code:	2195		
Telephone:	NA	Cell:	0722624325
E-mail:	kieren@ecologyinternational.net	Fax:	NA

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

If YES list the specialist reports attached below

NA

Signature of specialist:  Date: 2022-04-29

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 X 250m, if your proposed development is larger than this please use the appropriate number and orientation of hashed blocks

NORTH

WEST

31	**25**	**8**	**3**	**3**
31	**1**	**25**	**17**	**3**
31	**5**		**1**	**3**
31	**5**	**25**	**2**	**3**
31	**8 & 17**	**25**	**2**	**1**

EAST

= Site

SOUTH

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

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

Have specialist reports been attached	**YES x**	NO

If yes indicate the type of reports below

Vegetation Assessment
Terrestrial Fauna Assessment
Aquatic Risk Assessment
Heritage Impact Assessment
Social Assessment

The findings of the specialist studies are summarized below:

Aquatic Risk Assessment

The aquatic assessment identified a channelled valley-bottom wetland unit on the eastern border of the study area. The wetland was found to be in a Moderately Modified state (Ecological Category C). The Topographic Wetness Index (TWI) and a surface water flow accumulation model show that the proposed Access Control and Parking Site, and the Lower Cable Station and Visitor Centre are located within natural drainage areas feeding surface water into the identified channelled valley-bottom wetland. The potential for indirect impacts to the channelled valley-bottom wetland, due to the steep gradient of the site, is mitigated to some extent due to the presence of the Vereeniging Road (R82) between the proposed activities and the channelled valley-bottom wetland. A stormwater layout plan addresses the impacts of the hardened surfaces by means of Sustainable Urban Drainage (SUDS) measures.

The DWS Risk assessment shows a largely Low, with a Moderate Risk of impacts identified for selected activities due to the proposed placement of infrastructure (Bremner Dunne, 2021).

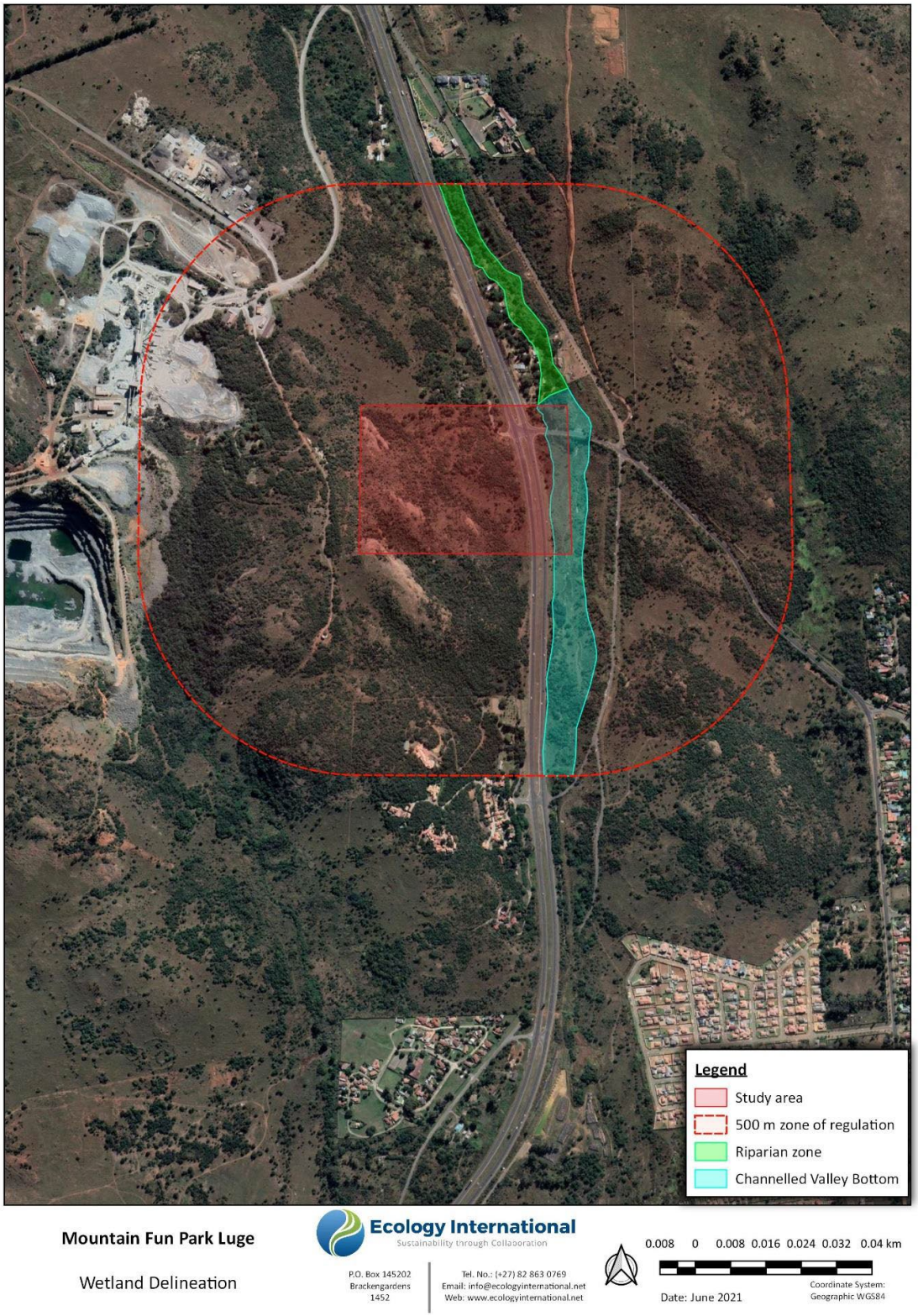


Figure 15. Study area in relation to the National Wetland Map.

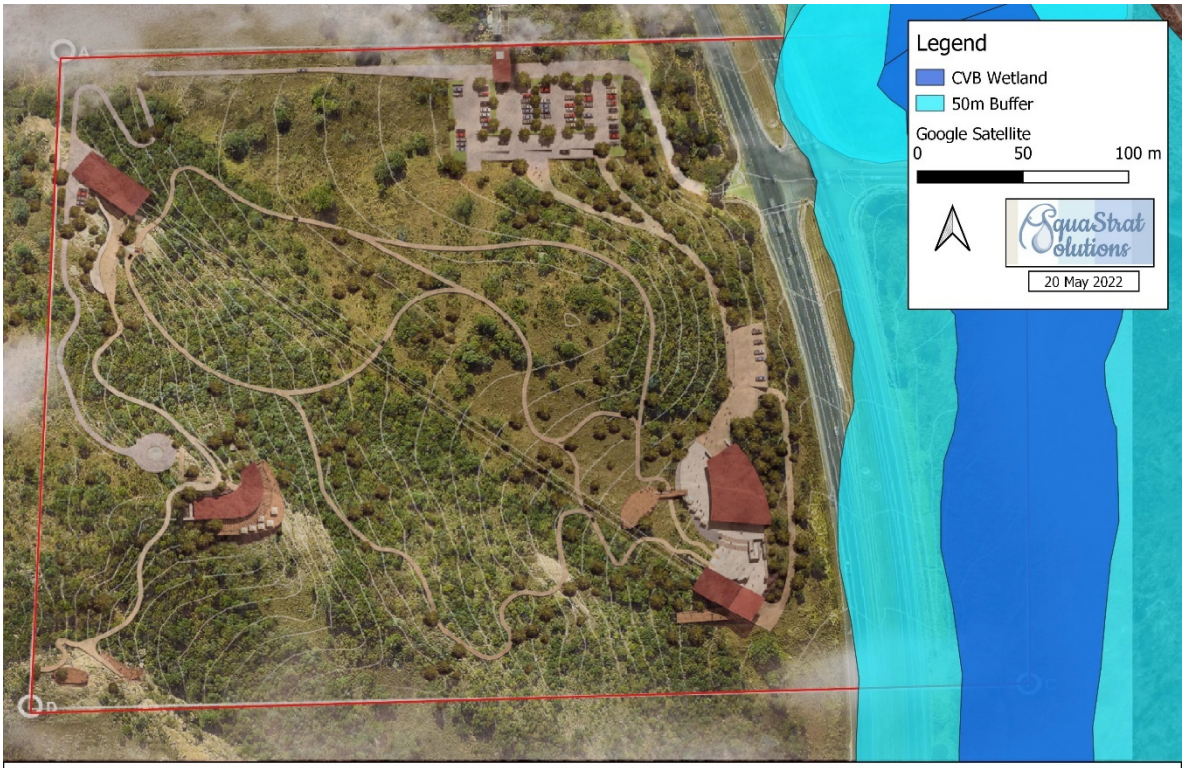


Figure 16. Proposed layout in relation to the wetland delineation and 50m buffer.

Vegetation Assessment

The proposed development will result in the removal of indigenous vegetation within an ecosystem listed as Critically Endangered in the gazetted draft list of ecosystems of 2011. The current NBA (2018) places the site in a Least Concern ecosystem; however, the gazetted Critically Endangered status has legal standing. Furthermore, the site falls within a CBA of the Gauteng Province and are considered as

Irreplaceable to reach the conservation targets in the province. In addition, a population of a vulnerable species, also listed in TOPS, were recorded on the site.

The site is also on a Gauteng Class 2 ridge in which low impact development activities, such as tourism facilities, which comprise of an ecological footprint of 5% or less of the property may be permitted as per the Gauteng Ridge Policy (GDACE, 2016). The ecological footprint includes all areas directly impacted on by a development activity, including all paved surfaces, landscaping, property access and service provision.

The proposed activity is in line with the development guideline for the area in that it proposes tourism facilities within a largely natural landscape. Construction can be mitigated and will not destroy the entire population of the Vulnerable species or the natural habitat. The development could provide an opportunity to protect and manage the species long term as the site is currently used for what seems to be initiation camps / religious activities and the habitat of the species are trampled. Illegal harvesting of several individual specimens of the Vulnerable species was noted on site during the second site visit in February 2022 and was reported to SANBI and GDARD.

The protected tree species recorded is however likely to be harvested at some stage. Several category 1b invasive species were recorded on the site and if left unchecked, will

change the habitat on the site and lead to a change in the vegetation structure and species diversity.
The specialist is thus of the opinion that the proposed project offers an opportunity to conserve and monitor the vegetation and species of concern on the site. Furthermore, construction phase impacts can be minimised. However operational activities are likely less manageable and may have a more long-term risk and impact on the Vulnerable species (e.g., increase in trampling, edge effects). Therefore, if the development is to proceed, a management plan for this species and its habitat, during construction and operation, must be implemented and regularly monitored and reported on to the GDARD.

The following **residual risks** remains:
• Natural processes such as fire will be prevented around the development as it poses a risk to lives and infrastructure. This will alter the species diversity and vegetation structure on the site.
• Trampling and edge effects by tourist and maintenance activities.
• Potential of illegal harvesting of plant species of conservation concern.
• Proliferation of informal paths due to pedestrians (Eyssell, 2022).

Figure 17. Vegetation communities on and around (50m) the site.

Measures to mitigate edge effects of the proposed activities and infrastructure are included in the EMP (vegetation and alien invasive species management) and will be included in the Ecological Management Plan to be compiled before construction.

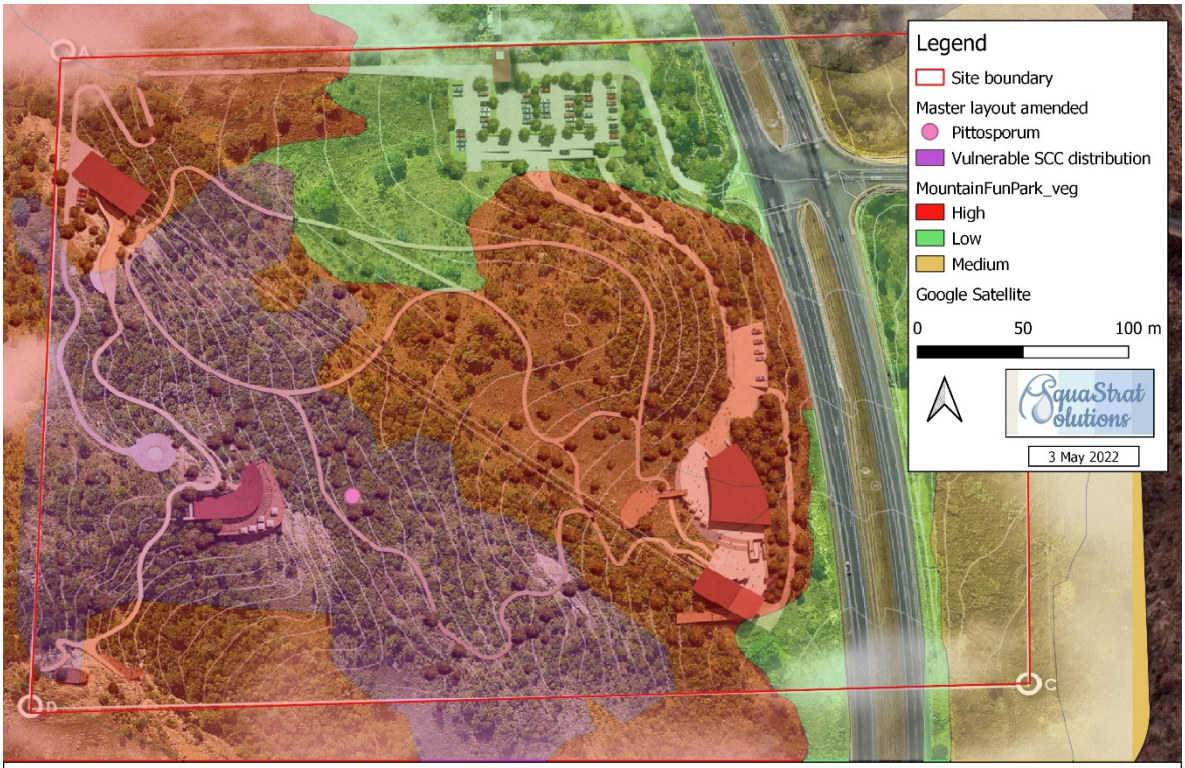


Figure 18. Proposed layout in relation to the vegetation sensitivity.

Fauna Assessment

The site is composed of rocky bushveld (divided into rocky bushveld and rocky outcrop habitats) with isolated patches of rocky grassland. Wetland habitat occurs east of Vereeniging Road and is outside the development footprint.

The anthropogenic activity in and around site (pedestrians and informal settlers) and the possible activity of domestic animals (feral cats), means that many animals could be hunted or chased off site, or bird nests could be disturbed and eggs scavenged.

The following is relevant in terms of **vertebrate** fauna species:

- None of the three vertebrate SCCs are likely to occur on site.
- In terms of other TOP species recorded in the greater area or likely to occur on site:
  - The TOP South African Hedgehog and Southern Mountain Reedbuck cannot be excluded from site.
  - The antelope will retreat from site when activity commences; the hedgehog will need to be actively monitored.
  - Secretarybird, Lanner Falcon, White-bellied Korhaan and Lesser Kestrel cannot be excluded from the development footprint, but anthropogenic activity on site is likely to keep these species from breeding on site. All are very mobile and reactive species that will move away from threats.
- Congregatory water birds / aquatic species are unlikely on the development footprint.
- The site is not within a significant area of faunal endemism.

In terms of **invertebrates**:

- The three SCCs cannot be excluded from site as the habitat appears to be appropriate, but the site is outside the main distribution range of *Lepidochrysops praeterita* (Lepidoptera: Lycaenidae). The rocky grassland is considered as the

primary habitat for all the species but limited sweep-netting did not confirm any species on site.

- There is no information on *Clonia uvarovi* (Orthoptera: Tettigoniidae) on the SANBI Species database and limited information on IUCN. Nothing is known about the species population trends and it is assumed present on site as a cautionary approach.
- A TOP spider was recorded in the QDGS, which cannot be excluded from site.

Overall site sensitivity is presented below. In terms of the findings, it must be stressed that the rocky bushveld scores a Low Site Ecological Importance (SEI) due to the fact that areas of rocky bushveld will remain unaffected and species are therefore highly likely to remain within this habitat unit.

Figure 19. Overall fauna sensitivity of the site.

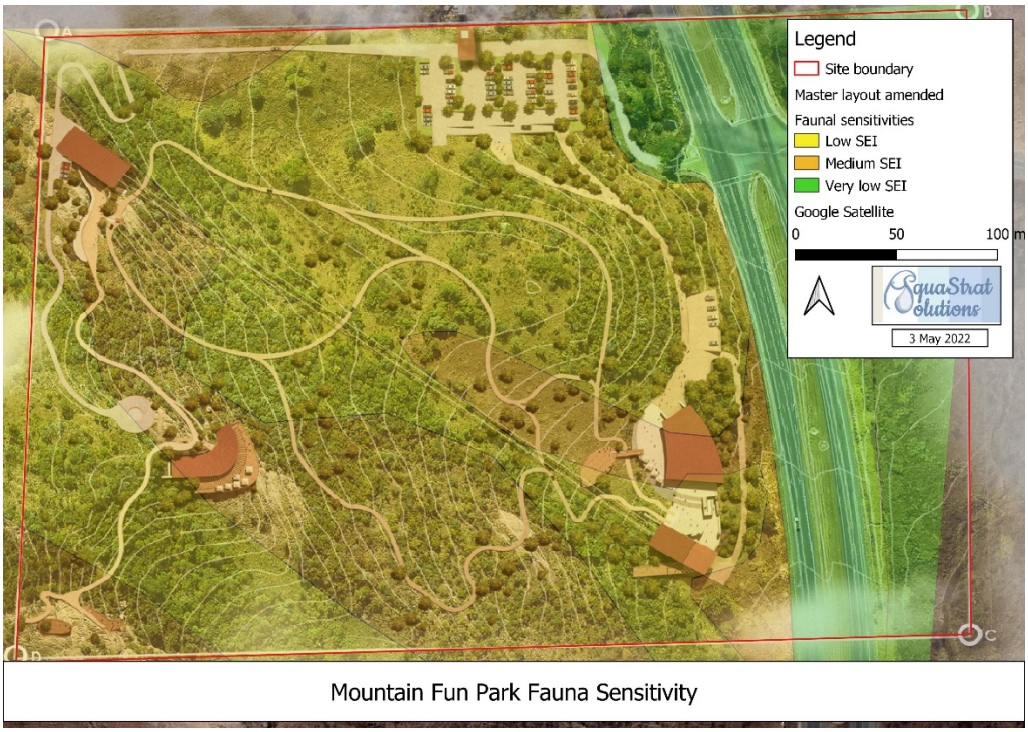


Figure 20. Proposed layout in relation to the fauna sensitivity.

The potentially more significant impacts assessed in this report include:

- Loss of rocky habitat is considered moderately significant and must be minimised.
- Loss of habitat connectivity and impairing the ecological corridor is considered moderately significant and must be reduced.
- Hampering or killing of TOP fauna is considered moderately significant and must be actively managed on site through monitoring and adaptive management.
- Attracting or exacerbation of existing fauna AIS is moderately significant and must be prevented as far as practically possible.
- Contamination to land and downstream runoff and contamination is considered moderately significant and must be prevented (Kasl, 2021).

The **Fauna Management and Monitoring plan** aims:

• To prevent the unnecessary destruction of natural habitat and animal life within the development area and to maintain ecological connectivity to neighbouring sites and, where possible, to regional ecological corridors.

• Not to unnecessarily or deliberately alienate or hinder the movement of fauna in the area or to harm any animal life found on the property.

• To maintain existing fauna biodiversity and prevent the skewing of fauna communities as far as possible.

After various follow-up meetings with authorities and environmental departments in early 2022, it was requested to include species-specific management measures / mitigations, focussing on how species with specific responses to the activity can be better accommodated to reduce impact. It was decided to focus on the TOP vertebrates, but comment has also been given for confirmed species and historically recorded species (including species not likely to occur on site). Species were grouped taxonomically into groups with similar habitats and / or behavioural characteristics. Table 11 of the Fauna Report, also included in the EMP, provides a summary of considerations and additional measures as may be relevant to these discrete groups of species.

Measures to improve connectivity on site will include the inclusion of underpasses, tunnels and bridges where movement may otherwise be hampered or affected by the tracks. Detailed designs in consultation with the specialist, and a site walk of the track layout with the specialist, will be done to ensure measures are correctly implemented.

Heritage Assessment

A single archaeological site was identified. It contains stone walls and no cultural material. A possible grave site was located with a single burial location. Presently, the property is being used by religious visitors. These visitors use several areas of the farm and leave behind scatters of broken earthenware ceramics, fireplaces and refuse.

The eastern area of the property (east of the R82) with the single possible burial should be avoided. In addition, the central area of the property with the archaeological site should also be avoided by implementing buffer zones around the area. Should these areas need to be destroyed/impacted during development, then a more detailed Phase II mitigation programme will be required to map their extent and preserve the archaeological remains. If development is approved and commences, and if any heritage resources are identified,

activities should be halted and a specialist consulted immediately following the chance finds protocol.

Heritage site locations:

1. Stonewalled structure (Site 030): 26°17'50.22"S 27°59'39.87"E (also including 033: 26°17'51.14"S 27°59'38.81"E, and 036: 26°17'50.94"S 27°59'39.93"E)
2. Possible human grave (Site 001): 26°17'53.20"S 27°59'49.77"E

Figure 21. Heritage stone wall locations on site (Forssman & Lotter, 2021).

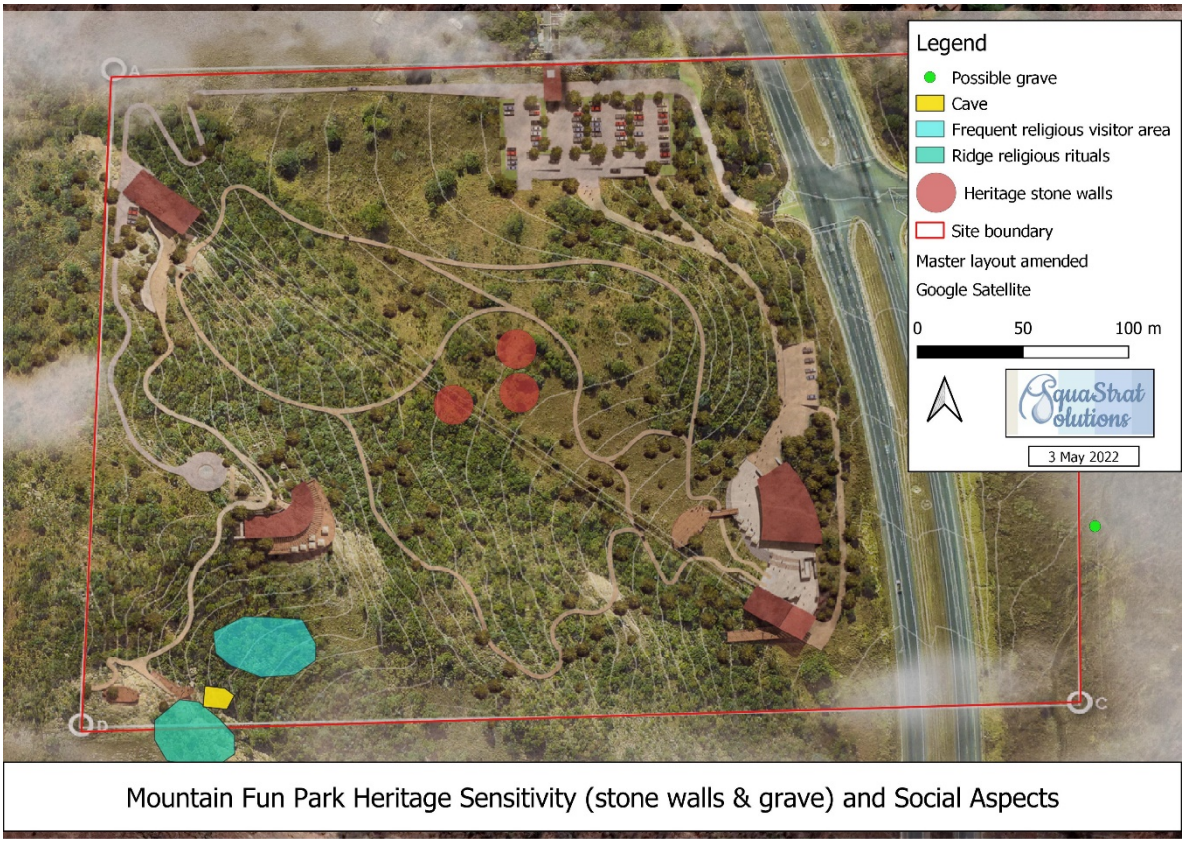


Figure 22. Proposed layout in relation to the heritage and social sensitivities.

Social Assessment

There was evidence all over the site that people were going to the site to pray and perform rituals, but the whole site is apparently not necessarily sacred/significant. The indication was that people instead choose to go there because it is undeveloped and quiet and that no-one is preventing them from going. I suspect that once the fun park is built, many will choose to go somewhere else, even if allowed access to certain areas. It is also suspected that the initiation school will choose to move to a different location, as they require seclusion.

The landowner/applicant has expressed his willingness to accommodate people who currently visit the site for religious purposes, and this is commendable. He has expressed concerns around the following issues and is open for suggestions on how these can be addressed in order to be able to accommodate people who use the site to pray:

1. Access (access will be controlled, as it will be used by families and children must be able to move around and have fun while being safe);
2. Potential damage to the site (environmental and physical, once the luge is operational);
3. Ablutions (as the planned development will be a family resort and therefore people relieving themselves in the open will be unacceptable);
4. Volumes (weekends and holidays will be busier at the fun park, and people who visit the site to pray also frequent the site more over the weekend);
5. Insurance/liability if someone who visits the site to pray is injured, even if they are not paying visitors to the fun park;
6. Security at night (as the site will be locked and secured at night); and
7. Fires and cutting of trees.

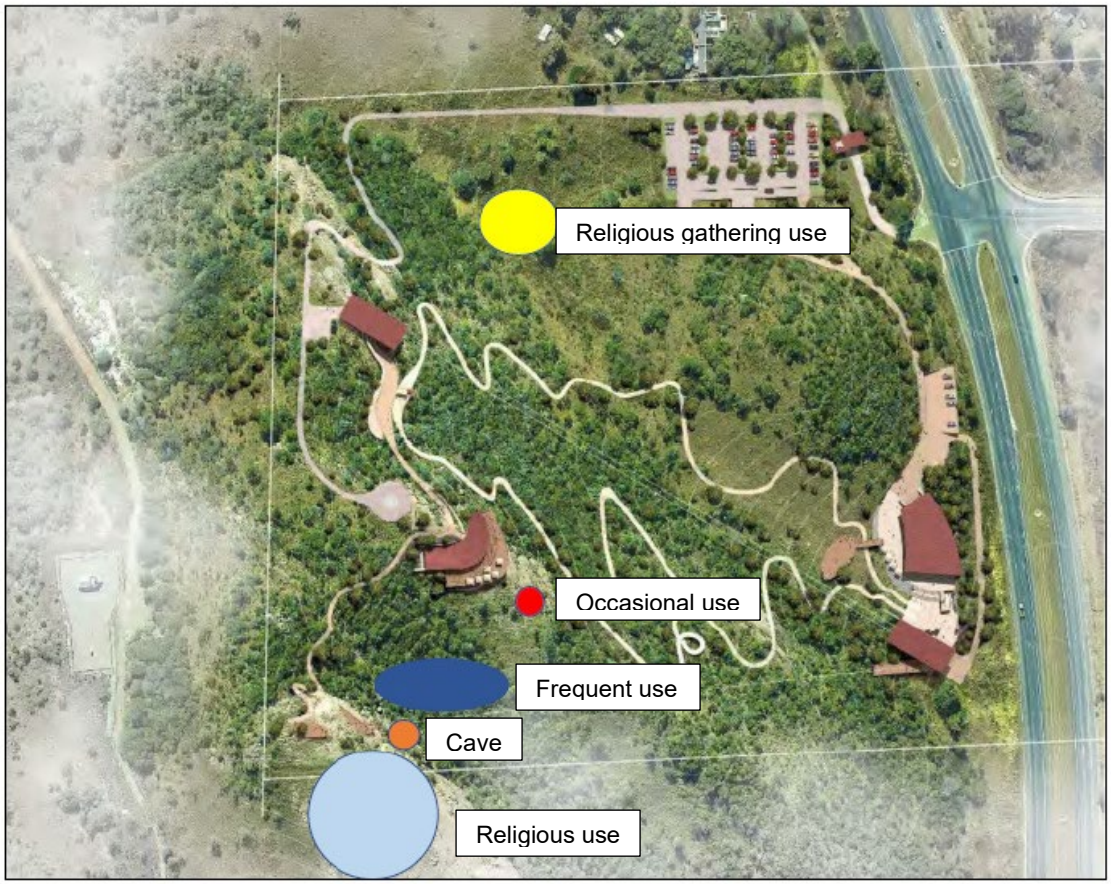


Figure 23. Social/Religious use locations on site.

Noise and Visual Assessment

The expected noise generated from the proposed activities include the cart noise from the track, visitor noise and general operational noise.

Noise levels of the carts were measured on a tar road surface in surroundings with a 33 decibel background reading, and the following readings were obtained:

- At 200 meters distance from the carts, no noise was detected with carts doing 15kph – 25kph
- at 100 meters distance from the carts, no noise was detected with carts doing 15kph
- at 100 meters distance from the carts, with carts doing 20kph, 46 decibels
- at 1m distance from the carts, with 4 carts racing at 20 – 25 kph, 76 decibels

Table 1: Summary of luge cart sound readings

Distance from carts	Speed of carts (kph)	Noise level (dBA)
200m	Up to 25	0
100m	15	0
100m	20	46
1m	Up to 25 (4 carts simultaneously)	76
Background/ambient	0	33

Noise generated from the track concrete surface is expected to be quieter than noise generated by the same activity on a tar road surface, as the concrete track is smoother and provides less resistance. The World Health Organization recommends sound pressure (noise) levels for specific district types, from which the SANS 10103 of 2008 provides the noise levels per district as per table below:

Type of district	Equivalent continuous rating level $L_{Req,T}$ for ambient noise dBA					
	Outdoors			Indoors, with open windows		
	Day-night L_{Rdn} [2]	Daytime L_{Rd} [1]	Night-time L_{Rn} [1]	Day-night L_{Rdn} [2]	Daytime L_{Rn} [1]	Night-time L_{Rn} [1]
a) Rural districts	45	45	35	35	35	25
b) Suburban districts with little road traffic	50	50	40	40	40	30
c) Urban districts	55	55	45	45	45	35
d) Urban districts with some workshops, with business premises and with main roads	60	60	50	50	50	40
e) Central business district	65	65	55	55	55	45
f) Industrial districts	70	70	60	60	60	50

According to the above table the outdoor daytime rating level for ambient noise in urban districts with main roads is 60 dBA and the rural districts 45 dBA. The distance of the closest occupied property is 254m from the activity, and from the luge cart sound level readings, no noise impact is expected to affect nearby residents and/or occupied properties.

Figure 24. Distances of nearest occupied properties from the proposed activity.

The visual impact assessment (GAPP, 2022) included three viewpoints from the eastern side of the site where visual impacts can be expected. Impacts are indicated in Figure 26 – 28 below.

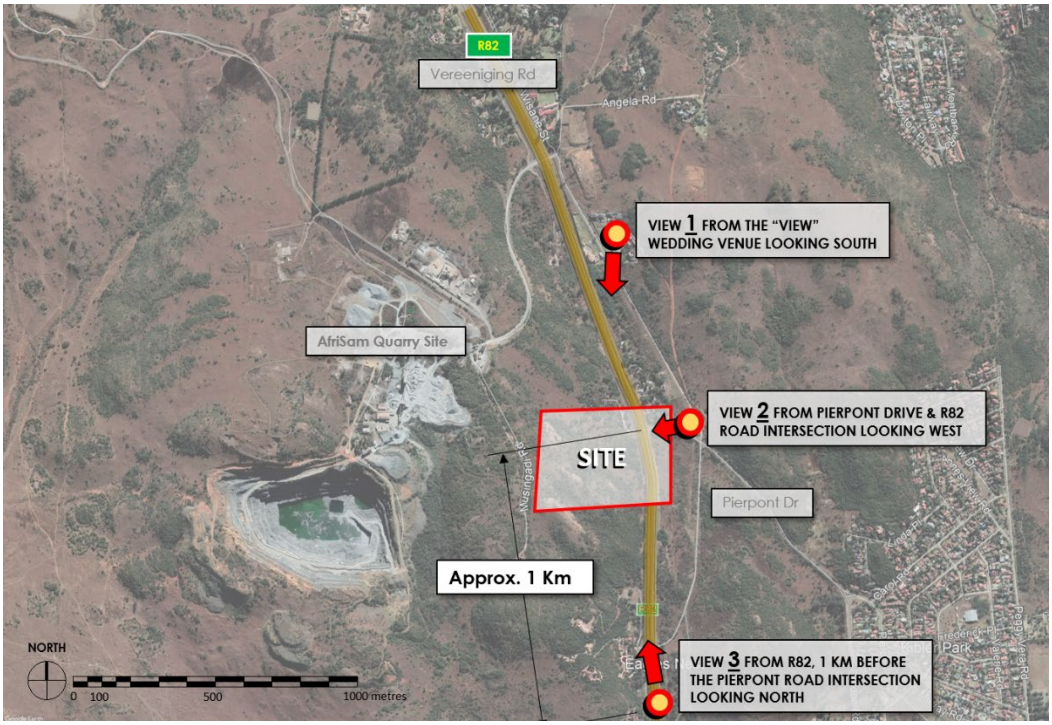


Figure 25. Viewpoints included in the visual assessment.

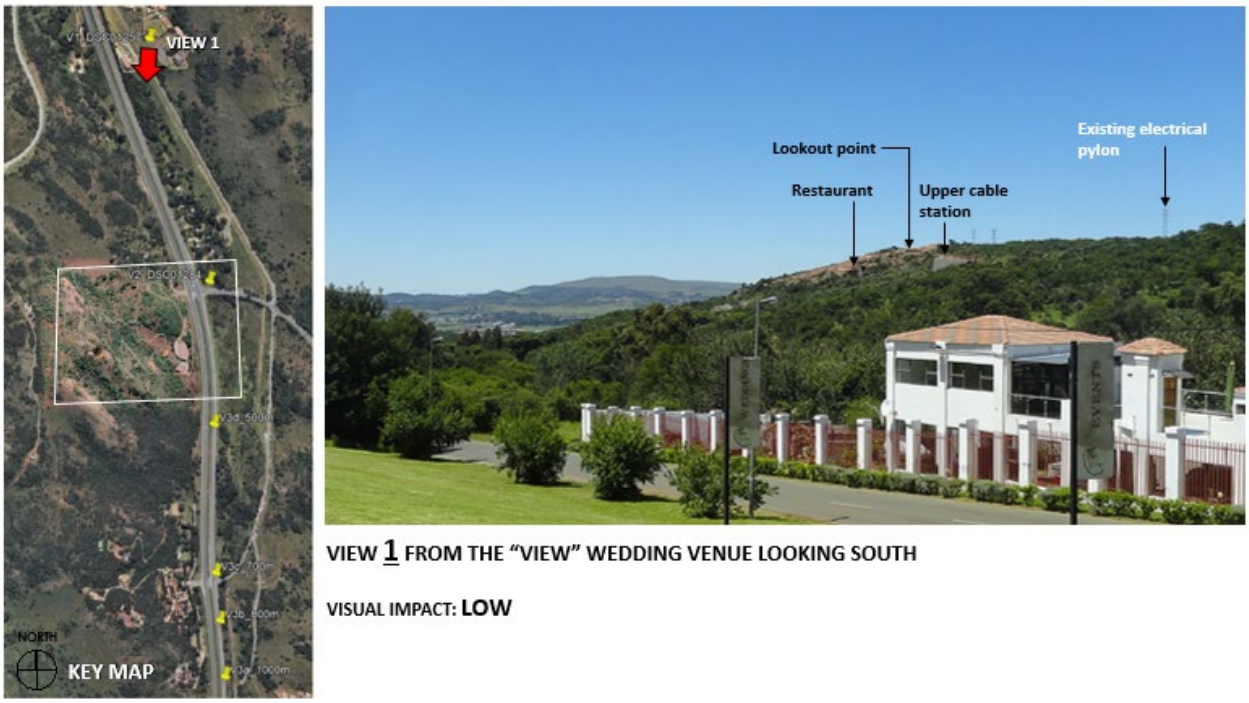


Figure 26. Impact of the proposed facility on viewpoint 1.

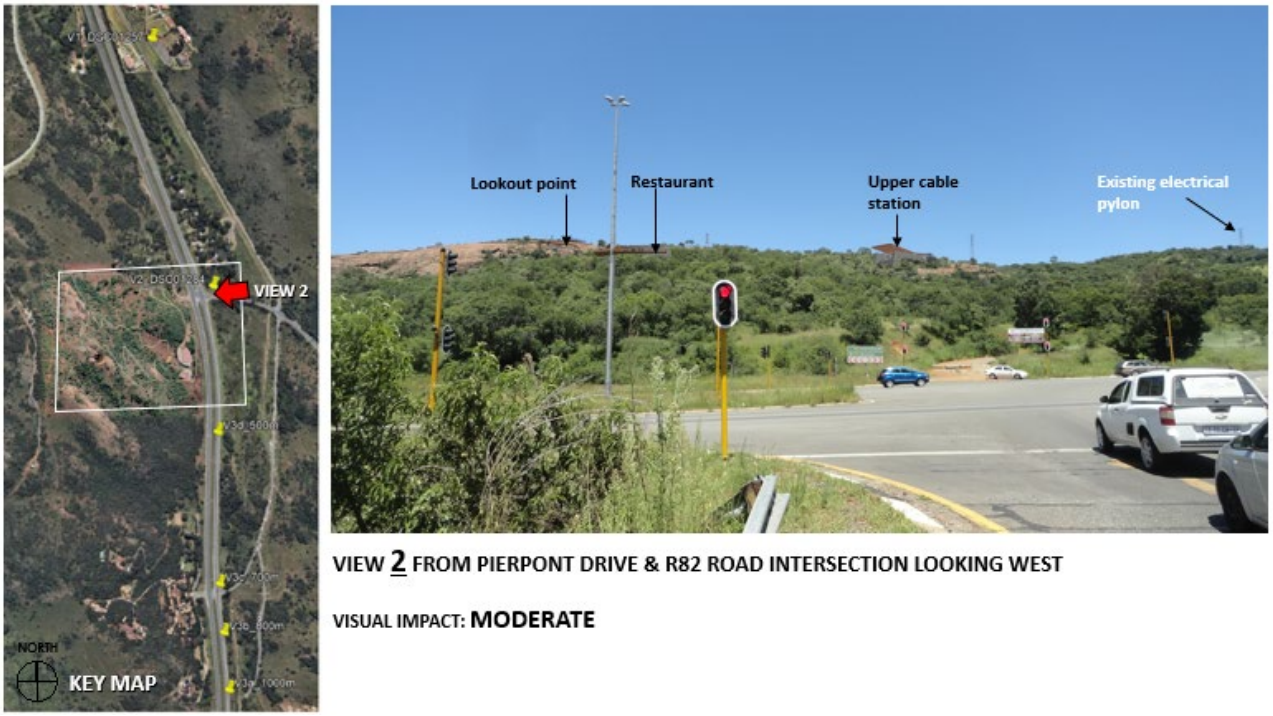


Figure 27. Impact of the proposed facility on viewpoint 2.

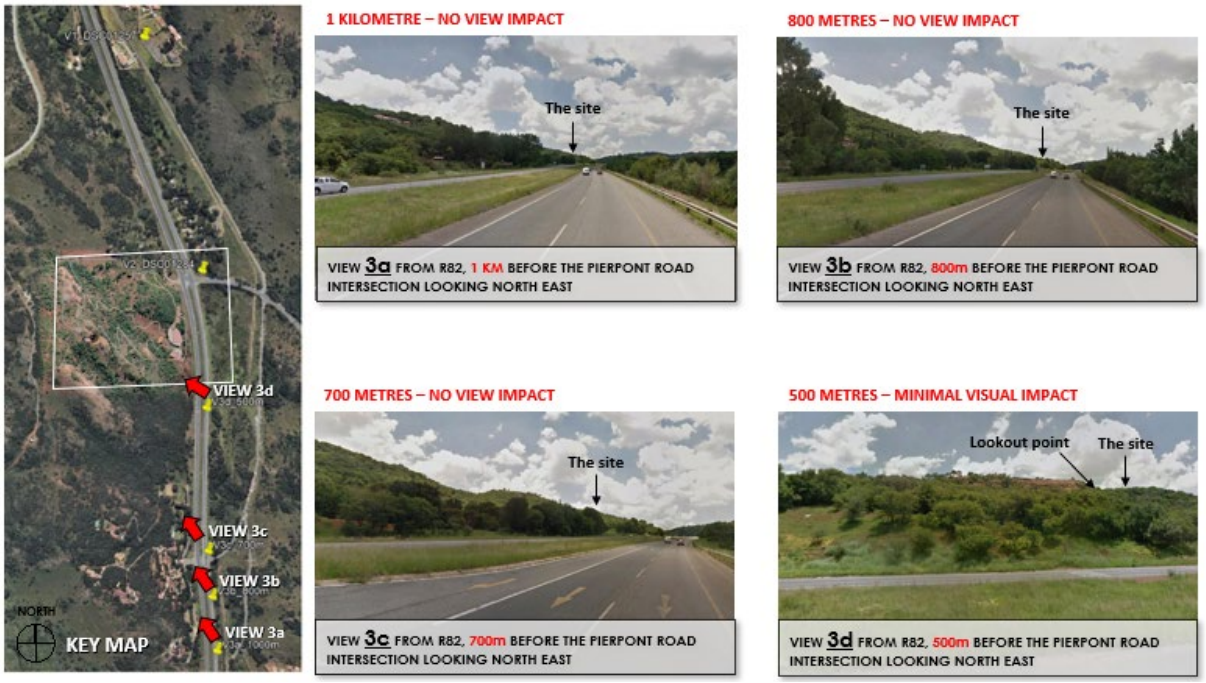


Figure 28. Impact of the proposed facility on viewpoint 1.

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.


A
B
C
D
E
F

Figure 29. Impacts of current status quo (photos from specialist studies and site visits).

Current impacts associated with the current visitors of the site include:

- informal shelters
- extensive firewood harvesting
- numerous fires, impact visible on Google Earth
- extensive footpath network
- trampling
- removal of SCC plants for medicinal use
- littering

The site is located on the Vereeniging Road (R82) approximately 16km south of the Johannesburg City Centre.
The site is located on a ridge west of the R82 and Kibler Park.
It is a semi-rural area characterised by rocky ridges with natural vegetation, agricultural small holdings and limited residential development.
Johannesburg South and the Southgate Mall are located 4km north of the site, Kibler Park and the Klipriviersberg Nature Reserve are to the east, the Eagles Nest Estate, the Eikenhof agricultural area, various rural business and the Kliprivier Valley are further to the south and the Afrisam Quarry and Rand Water Eikenhof Pump Station are located to the west.
Adventure and outdoor attractions in the area include the Klipriviersberg Nature Reserve and Eikenhof which is popular amongst cyclists, trail runners, horse riders, orienteers etc. Paintball, off-road motorbike track and model aeroplane activities are all located nearby.

Other more formal recreational facilities in close proximity include Gold Reef City, Wemmer Pan, the Orlando Towers Adventure Centre, a variety of country restaurants and accommodation offerings (GAPP, 2022).

The 2021/22 Johannesburg IDP refers to Tourism Development as a supporting function to "ensure and monitor compliance with appropriate environmental and heritage management legislation in respect to tourism development and operations", which is addressed by the monitoring, auditing and reporting requirements of the EMPr and Ecological Management Plan.

The impact of COVID 19 is discussed in the IDP and actions include "providing stimulus and accelerating recovery", under which "mainstream environmental sustainability" is listed as a guiding principle. Sustainable Environment Development is also listed as a strategic priority in the IDP. The proposed development fulfills this goal, and this is illustrated by the positive operational phase impacts in Section E of this report.

10. CULTURAL/HISTORICAL FEATURES

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

38. (1) Subject to the provisions of subsections (7), (8) and (9), any person who intends to undertake a development categorised as-
(a) the construction of a road, wall, powerline, pipeline, canal or other similar form of linear development or barrier exceeding 300m in length;
(b) the construction of a bridge or similar structure exceeding 50m in length;
(c) any development or other activity which will change the character of a site-
(i) exceeding 5 000 m2 in extent; or
(ii) involving three or more existing erven or subdivisions thereof; or
(iii) involving three or more erven or divisions thereof which have been consolidated within the past five years; or
(iv) the costs of which will exceed a sum set in terms of regulations by SAHRA or a provincial heritage resources authority;
(d) the re-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 X**	NO

If YES, explain:

Stone walling in the centre of the site and a potential grave in the eastern section of the side not earmarked for development.

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:

See Heritage and Social Assessment sections in No.8 above.

Will any building or structure older than 60 years be affected in any way?	**YES X**	NO
Is it necessary to apply for a permit in terms of the National Heritage Resources Act, 1999 (Act 25 of 1999)? If yes, please attached the comments from SAHRA in the appropriate Appendix	YES	**NO x**

SECTION C: PUBLIC PARTICIPATION (SECTION 41)

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

2. LOCAL AUTHORITY PARTICIPATION

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

Was the draft report submitted to the local authority for comment?	**YES** X	NO
If yes, has any comments been received from the local authority?	**YES**	NO X

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

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

Responses will be included in the Final BAR

3. CONSULTATION WITH OTHER STAKEHOLDERS

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

Has any comment been received from stakeholders?	**YES X**	NO

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

During public meetings held in 2021 with CoJ, and KlipSA with other I & APs, respectively the following aspects were raised, and subsequently addressed in the Draft BAR (Apr 2022):

- Request to see final layout following second vegetation site visit of Feb 2022
- Fencing needs to allow for faunal movement
- Noise and visual impacts need to be investigated
- Social impact assessment to describe religious use of site
- Proposed footprint is 11% vs GDARD Ridges policy of 5%
- Method statement for the construction of tracks and buildings
- Confirmation of blast rock zone of Afrisam quarry
- Mitigation measures for all impacts to be included in EMP

(Issues & Concerns Register included in PP Report, Appendix E).

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

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

5. APPENDICES FOR PUBLIC PARTICIPATION

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

Appendix 1 – Proof of site notice

Refer to Annexure E1

Appendix 2 – Written notices issued as required in terms of the regulations

Refer to Annexure E2

Appendix 3 – Proof of newspaper advertisements

Refer to Annexure E3

Appendix 4 –Communications to and from interested and affected parties

Refer to Annexure E4

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

No public meeting was required.

Appendix 6 - Comments and Responses Report

Refer to Annexure E6

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

Refer to Annexure E6

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

N/A

Appendix 9 – Copy of the register of I&APs

Refer to Annexure E9

Appendix 10 – Comments from I&APs on the application

Refer to Annexure E6

Appendix 11 – Other

Not Applicable – No Other Information

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. **Proposal** (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 x	NO

If yes, what estimated quantity will be produced per month? 20 m^3

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

Construction waste will be collected and stored in waste skips on-site. The construction waste will then be collected by a licensed service provider and disposed of at a suitable registered waste disposal site. No more than 100m^3 of general waste (including construction waste) will be stored on site at any given time.

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

Construction waste will be disposed of at an approved waste disposal site.

Will the activity produce solid waste during its operational phase?

YES X	NO

If yes, what estimated quantity will be produced per month?	5m3

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

Waste from restaurant and visitor center activities will be disposed of in the municipal bins.

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 X**

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

The litter loads are not excessive and will be included in current waste disposal in municipal bins.

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 x**

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 x**

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:

Bins for sorting waste will be provided to visitors.

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 x**
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 x**
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 x**

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 X**	NO
If yes, what estimated quantity will be produced per month?	0.15l/s (ave)	
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 X**	

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

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 x**
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:

2. WATER USE

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

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

If water is to be extracted from groundwater, river, stream, dam, lake or any other natural feature, please indicate the volume that will be extracted per month: Not applicable 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 x**

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 appendix)	YES	NO

3. POWER SUPPLY

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

Eskom will supply electricity

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:

The main activity is gravity driven carts, and the main electricity use is for cable car stations, restaurant and visitor centre.

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

Solar panels may be considered for partial power provision.

Section E: impact assessment

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

1. ISSUES RAISED BY INTERESTED AND AFFECTED PARTIES

Summarize the issues raised by interested and affected parties.

Comments from and responses to GDARD comments will be included in the PP Report (Appendix E) of the Final BAR.

Summary of response from the practitioner to the issues raised by the interested and affected parties (including the manner in which the public comments are incorporated or why they were not included)
(A full response must be provided in the Comments and Response Report that must be attached to this report):

Comments from and responses to GDARD comments will be included in the PP Report (Appendix E) of the Final BAR.

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

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

Impact Assessment Methodology

Impact assessment processes were developed in order to:

(a) identify potential impacts of a proposed development/activity on the environment
(b) predict the likely nature of these impacts and
(c) evaluate the significance of the potential impacts.

Negative impacts are identified, described, rated in terms of the spatial scale, duration, severity and probability to determine the magnitude of the significance of the specific individual impacts.

In many proposed projects, there may be **positive impacts**, which are actions and activities with a positive contribution to overall ecological and/or habitat functioning and health, above and beyond the mitigation measures for the negative impacts of the project. These positive impacts are only considered to be relevant if the criteria below can be met:

- Positive impact must align with conservation goals for the vegetation type and local, provincial and national development frameworks and plans.
- Positive impact is considered a long-term impact and not simply related to the construction phase mitigation measures.
- Management actions to achieve positive impact are prescribed and regulated by means of an EMPr and Environmental Authorisation to ensure ongoing implementation, monitoring, auditing and adaptive management

Rating of positive impacts are done by means of the same rating system used for negative impacts as described below and an **Adjusted Significance** rating is calculated for the relevant impacts.

Significance is a fundamental concept in the impact assessment steps above and ultimately, in decision-making within the specific socio-economic and environmental contexts. Significance consists broadly of three forms, namely Institutional recognition (including legislation, policies, guidelines), Public recognition (ex. voluntary conservation action) and Technical recognition (scientific and technical assessments of critical resource characteristics).

Significance can be determined in terms of a three-stage process involving scaling, weighting and aggregation (DEAT, 2002).
Scaling is the standardization of empirical data onto a common scale to allow comparisons between different types of impacts.

Weighting is the imposition of professional and/or societal values on a range of potential environmental impacts.
Aggregation is the combination of different types of impact values to produce composite scores, which facilitates a comparison of project alternatives.

Predictions on the nature of the impacts are based on simplified conceptual models of how natural processes function. Criteria that can be used to describe the nature of an impact include (DEAT, 2002; GN 326 of 2017; Chetty, 2015):

- spatial extent;
- resource sensitivity
- duration and timing of the impact;
- intensity or severity of the impact;
- status of the impact (i.e. either positive (a benefit) or negative (a cost) or neutral);
- reversibility (i.e. reversible or permanent);
- probability of occurrence
- degree of certainty; and
- mitigatory potential.

Rating
Although there are numerous approaches internationally to impact determination, the current general practice of determining significance is to derive it from a combination of scientific methods and values ascribed by the EIA team. The criteria from the list in 12.1 were incorporated in the four main aspects of significance determination, including spatial scale, duration, severity and probability. Rating of each criterion is based on a sliding scale with high impacts rated as 5, medium-high as 4, medium as 3, low-medium as 2 and low as 1. Each significance score is therefore assessed in relation to the highest potential score of 10 as indicated in Table 6 below.

Degree of certainty is indicated for each impact assessed, however is not included in the significance rating calculation, and is rather meant as a reference to the data source used to identify the impact. Degree of certainty is based on the following criteria:

Table 2: Criteria for rating the degree of certainty of the impact rating

Degree of certainty	
Scientific data: specialist assessment specified impact rating	High
Inferred from specialist assessment	Medium
Generally associated impact	Low

The criteria for rating the nature of impacts (DEAT, 2002) are illustrated below:

Table 3: Criteria for rating the extent or spatial scale of impacts

Spatial scale Rating		**Numerical rating**
High	Widespread; Far beyond site boundary Regional/national/international scale	5
Medium-High	Within local catchment	4
Medium	Beyond site boundary Local area	3
Low-Medium	Within site boundary	2
Low	Within site footprint	1

Table 4: Criteria for rating the duration of impacts

Duration Rating		Numerical rating
High (Long term)	Permanent. Beyond decommissioning. Long term (More than 15 years).	5
Medium-High	Not easily reversible over time. Lifespan of the project and several years beyond. Medium term (5 – 15 years).	4
Medium (Medium term)	Reversible over time. Lifespan of the project and a short time beyond. Medium term (3 – 5 years).	3
Low-Medium	Relatively quickly reversible. Lifespan of the project. Medium short term (1 – 2 years).	2
Low (Short term)	Quickly reversible. Less than the project lifespan. Short term (0 – 1 years).	1

Table 5: Criteria for rating intensity or severity of impacts

Severity Rating		Numerical rating
High	Disturbance of pristine areas that have important conservation value; or Destruction of rare or endangered species.	5
Medium-High	Disturbance of areas that have confirmed conservation value or are of use as resource; or Complete change in large-scale species occurrence or variety.	4
Medium	Disturbance of areas that have potential conservation value or are of use as resource; or Complete change in species occurrence or variety on site.	3
Low-Medium	Disturbance of partially degraded areas, which have little conservation value; or Small change in species occurrence or variety.	2
Low	Disturbance of highly degraded areas, which have little conservation value; or Negligible change in species occurrence or variety.	1

Table 6: Criteria for rating probability of impacts occurring

Probability Rating		Numerical rating
High	Very likely to occur	5
Medium-High	Likely to occur regularly	4
Medium	Likely to occur occasionally	3
Low-Medium	Small likelihood	2
Low	Not likely	1

Table 7: Summary of impact magnitude and significance

Impact Magnitude and Significance Rating		Rating range	
		NEG	POS
High	Of the highest order possible within the bounds of impacts that could occur. In the case of adverse impacts, there is no possible mitigation that could offset the impact, or mitigation is difficult, expensive, time-consuming or some combination of these. Social, cultural and economic activities of communities are disrupted to such an extent that these come to a halt. In the case of beneficial impacts, the impact contributes significantly to conservation goals and will bring about long-term positive change.	**9 - 10**	**9 - 10**
Medium-High	Impact is unavoidable and relatively substantial. Mitigation requires higher level of input than EMP, i.e., specialist input such as an Ecological Management Plan. Social, cultural and economic activities of communities continue in the changed form. In the case of beneficial impacts, the impact contributes to conservation goals and will bring about long-term positive change.	**7 - 8**	**7 - 8**
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, the impact may contribute to conservation goals and will bring about some positive change.	**5 - 6**	**5 - 6**
Low-Medium	Impact is of a low order but may have a small effect. Mitigation is relatively easily achieved by implementing EMP measures. Small changes to social, cultural and economic activities of communities. In the case of beneficial impacts, the impact will bring about a positive change in the medium term.	**3 - 4**	**3 - 4**
Low	Impact is of a low order and therefore likely to have little real effect. In the case of adverse impacts, mitigation is either easily achieved or little will be required, or both. Social, cultural and economic activities of communities can continue unchanged. In the case of beneficial impacts, alternative means of achieving this benefit are likely to be easier, cheaper, more effective and less time-consuming. In the case of beneficial impacts, the impact will bring about a small positive change in the short term.	**1 - 2**	**1 - 2**
No impact	Zero impact.	**0**	

Mitigation

Mitigation is defined in the EIA Regulations (GN 326 of 2017) as “to anticipate and prevent negative impacts and risks, then to minimise them, rehabilitate or repair impacts to the extent feasible”. Mitigation measures are included in each specialist assessment and these are included in the impact assessment to show an impact score before and after

mitigation. The Environmental Management Plan includes all expected impacts from the proposed activities above, as well as mitigation, monitoring and auditing requirements.

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.

Preferred Alternative Score Summary:

The preferred alternative has the lowest construction and operational phase scores after mitigation in comparison to all other alternatives. All site sensitivities were considered and the layout amended to minimize interception of especially the SCC localities, the TOP tree specimen (cannot be moved), as well as heritage structures and social aspects.

The various impacts of the preferred alternative are rated below in terms of the construction and operational phases. The impacts of the other alternatives are similar to the Preferred Alternative with the exception of the blue blocks in each table below.

Table 8: Summary of impact scores of Preferred Alternative

Category	Impact Score before Mitigation	Impact Score after Mitigation
Construction Phase		
Terrestrial Ecosystem	8: Med-high	4: Low-medium
Aquatic Ecosystem	6: Medium	3: Low-medium
Water Resources	6: Medium	3: Low-medium
Heritage Resources	7: Med-high	3: Low-medium
Social Aspects	8: Med-high	4: Low-medium
Air Quality	7: Med-high	4: Low-medium
Waste Management	8: Med-high	4: Low-medium
Noise	5: Medium	2: Low
Traffic	5: Medium	2: Low
Total Construction Impact Score	**6: Medium**	**3: Low-medium**
Operational Phase		
Terrestrial Ecosystem	6: Medium	4: Low-medium
Adjusted Terrestrial Ecosystem score	**4: Low-medium**	**2: Low**
Aquatic Ecosystem	6: Medium	3: Low-medium
Water Resources	6: Medium	3: Low-medium
Heritage Resources	6: Medium	2: Low
Social Aspects	5: Medium	2: Low
Waste Management	7: Med-high	3: Low-medium
Noise	5: Medium	2: Low
Traffic	5: Medium	2: Low
Total Operation Impact Score	6: Medium	**2: Low**

Alternative 1: Layout 1

The first layout was drawn up before site sensitivities were known and therefore does not incorporate the sensitivities like the preferred alternative.

Table 9: Summary of impact scores of Alternative 1

Category	Impact Score before Mitigation	Impact Score after Mitigation
Construction Phase		
Terrestrial Ecosystem	9: High	6: Medium
Aquatic Ecosystem	6: Medium	3: Low-medium
Water Resources	6: Medium	3: Low-medium
Heritage Resources	8: Med-high	4: Low-medium
Social Aspects	8: Med-high	4: Low-medium
Air Quality	7: Med-high	4: Low-medium
Waste Management	8: Med-high	4: Low-medium
Noise	5: Medium	2: Low
Traffic	5: Medium	2: Low
Total Construction Impact Score	**7: Med-high**	**4: Low-medium**
Operational Phase		
Terrestrial Ecosystem	9: High	**7: Med-high**
Adjusted Terrestrial Ecosystem score	8: Med-high	5: Medium
Aquatic Ecosystem	6: Medium	3: Low-medium
Water Resources	6: Medium	3: Low-medium
Heritage Resources	8: Med-high	5: Medium
Social Aspects	5: Medium	2: Low
Waste Management	7: Med-high	3: Low-medium
Noise	5: Medium	2: Low
Traffic	5: Medium	2: Low
Total Operation Impact Score	**7: Med-high**	**3: Low-medium**

No-go - Status quo continues.

The current state of the site includes the following impacts:

- removal of Vulnerable SCC plant, presumably for medicinal use
- uncontrolled fires
- unlimited footpaths and other vegetation clearing activities
- littering, candle burning, urination and defecation

Despite these impacts, there are many site sensitivities that will remain unmanaged if the status quo continues.

Table 10: Summary of impact scores of the No-go Alternative

Category	Impact Score
Terrestrial Ecosystem	9: High
Aquatic Ecosystem	5: Medium
Water Resources	5: Medium
Heritage Resources	8: Med-high
Social Aspects	3: Low-medium
Waste Management	8: Med-high
Noise	2: Low
Traffic	2: Low
Total Operation Impact Score	**5: Medium**

2.1 IMPACTS THAT MAY RESULT FROM THE CONSTRUCTION PHASE FOR THE PREFERRED ALTERNATIVE:

NEG/POS	Potential impacts	Spatial scale	Duration	Severity	Probability	Degree of certainty	Significance before mitigation	Proposed mitigation: summary	Significance after mitigation	Risk management measures
TERRESTRIAL BIODIVERSITY, HABITAT & ECOLOGY										
Neg	Destruction of habitat due to vegetation clearing	3	3	4	5	High	8: Med-high	Benefits of fencing and managing the property include: • Reduce current (too) frequent fires • Reduce damage to vegetation with rehabilitation of footpaths • Reduce/eliminate harvesting of SCC Mitigation: • All construction-related impacts (including access to activity site, storing of equipment/building materials/vehicles or any other activity) should be kept in the limits of the footprint.	5: Medium	▪ Appoint an ECO during construction to ensure compliance with the EMP and authorizations ▪ Implement Rehabilitation measures ▪ Ongoing monitoring and management as per EMP and Ecological Management Plan.
Neg	Loss of SCC (removal of individuals)	3	5	4	5	High	9: High		5: Medium	
Neg	Potential loss of invertebrates and TOP species	2	5	4	3	High	7: Med-high		4: Low-medium	
Neg	Proliferation of alien vegetation	2	4	4	4	High	7: Med-high		4: Low-medium	
Neg	Bush densification from altered ecological processes	2	4	4	4	High	7: Med-high		4: Low-medium	
Neg	Loss of rocky habitat	2	5	5	5	High	9: High		5: Medium	
Neg	Loss of habitat connectivity	3	5	4	5		9: High		5: Medium	

Neg	Soil contamination	3	3	4	4	High	7: Med-high	• All assembly or pre-casting must be done in a designated non-sensitive area. • Ecological Management Plan to be drawn up and implemented • Declared weed and invader species must be removed – ongoing after construction/installation. • All areas of disturbed and compacted soils need to be ripped, landscaped and be prepared for vegetation re-establishment. • Spills and waste should be immediately cleaned up/removed. Spill kit on site. • Topsoil must be stored separately to protect seedbank for vegetation re-establishment. • Any disturbed, denuded or eroded areas noted must be rehabilitated to avoid progressive habitat degradation	4: Low-medium	▪ **Risk of not implementing mitigation** is high, as vegetation removal could cause increasing fragmentation and edge effects, and degradation of grassland.
Neg	Soil erosion, compaction & creation of preferential flow paths	3	3	4	4	High	7: Med-high		4: Low-medium	
TERRESTRIAL ECOSYSTEM IMPACT SCORE							**8: Med-high**		**4: Low-medium**	

AQUATIC ECOSYSTEMS										
Neg	Geomorphology: Sedimentation	3	3	3	3	Med	6: Medium	• Runoff and sediment control to be implemented during construction. • Implementation of SWMP as soon as construction activities allow • Avoid hydrocarbon and construction material spills – waste management. • Re-establishment of indigenous vegetation as soon as possible after construction • Domestic wastewater: report all sewer and water leaks to council immediately and provide the reference number to the ward councillor for escalation.	3: Low-medium	▪ Strict erosion control measures must be implemented during the construction. ▪ Appoint an ECO during construction to ensure compliance with the EMP and authorizations ▪ Ongoing monitoring and management as per EMP
Neg	Water Quality	4	3	3	4	High	7: Med-high		4: Low-medium	
Neg	Hydrology	3	3	3	3	High	6: Medium		3: Low-medium	
Neg	Habitat & biota	2	3	3	3	Low	6: Medium		3: Low-medium	
AQUATIC ECOSYSTEM IMPACT SCORE							**6: Medium**		**3: Low-medium**	
WATER RESOURCES										
Neg	Groundwater Resource	3	4	3	2	Low	6: Medium	• Avoid soil contamination • Prevent contaminated runoff from leaving the site • Prevent and control erosion	3: Low-medium	External audits to be done as per EMP.
Neg	Hydrology	3	3	3	3	Low	6: Medium		3: Low-medium	

								• Sewer and water pipeline connections (horizontal directional drilling): pits must be located outside the wetland and buffer zone.		
WATER RESOURCES IMPACT SCORE							**6: Medium**		**3: Low-medium**	
HERITAGE RESOURCES										
Neg	Destruction of stonewalled heritage sites	2	5	3	4	High	7: Med-high	• 15m buffer around 3 stone walls to be cordoned off during construction • If archaeological sites or graves are exposed during construction work, it should immediately be reported to a heritage practitioner so that an investigation and evaluation of the finds can be made.	3: Low-medium	Heritage resources could be destroyed by construction activities; however, if the buffer zone of 15m is implemented the risk is low.
HERITAGE RESOURCES IMPACT SCORE							**7: Med-high**		**3: Low-medium**	
SOCIAL ASPECTS										
Neg	Impacts on religious activities on site	2	5	3	5	High	8: Med-high	• Areas of importance were identified and are not intercepted by site activities • Access for religious purposes to individuals currently visit the site and want to apply for access, will be	4: Low-medium	If mitigation is not implemented, religious users of the site will likely use the adjacent vacant properties, as

								provided access and visitor's rules will apply.		these are similar in character.
SOCIAL ASPECTS IMPACT SCORE							**8: Med-high**		**4: Low-medium**	
AIR QUALITY										
Neg	Fugitive particulate emissions (dust) related to construction activities.	3	3	4	3	Low	7: Med-high	• Dust Control measures to be put in place as per the EMPr.	4: Low-medium	Expected risk is low.
AIR QUALITY IMPACT SCORE							**7: Med-high**		**4: Low-medium**	
WASTE MANAGEMENT										
Neg	Soil/water/air pollution due to improper waste handling, storage and disposal	4	4	4	4	High	8: Med-high	• General litter from construction workers as wells as construction waste on site must be effectively controlled. • Rubble and general construction waste on site should be removed at regular intervals. • The Contractor must prevent littering and the random discard of solid waste on the site. • Waste collected during the construction phase will be recycled,	4: Low-medium	With the implementation of mitigation methods all impacts can be prevented.

								re-used or recovered as far as economically feasible.		
WASTE MANAGEMENT IMPACT SCORE							**8: Med-high**		**4: Low-medium**	
NOISE										
Neg	Nuisance to visitors and neighbouring residents from construction activities.	3	1	3	3	Low	5: Low-Medium	• The contractor must be familiar with and adhere to any regulations and local by-laws regarding the generation of noise and hours of operation. • All construction activity will take place during normal working hours (between 8am and 5pm).	2: Low	Nuisance noise caused by construction activities is expected to be of short duration.
NOISE IMPACT SCORE							**5: Low-Medium**		**2: Low**	
TRAFFIC										
Neg	Increased traffic in the project area and in the region	3	1	3	3	Low	5: Low-Medium	• All contractors should commit to following road safety rules.	2: Low	Traffic is not expected to be significantly impacted.

Neg	Risks to the safety of pedestrians and road users	3	1	3	3	Low	5: Low-Medium	• Traffic to and from the construction site should be limited to daylight hours. • Appropriate signage must be placed. • Contractor must ensure that trucks are not overloaded.	2: Low	Normal road rules and precautions apply.
TRAFFIC IMPACT SCORE							**5: Low-Medium**		**2: Low**	

2.2 IMPACTS THAT MAY RESULT FROM THE OPERATIONAL PHASE FOR THE PREFERRED ALTERNATIVE

	Potential impacts:	**Spatial scale**	**Duration**	**Severity**	**Probability**	**Degree of certainty**	**Significance before mitigation**	**Proposed mitigation:**	**Significance after mitigation** **Adjusted significance**	**Risk management measures**
TERRESTRIAL BIODIVERSITY, HABITAT & ECOLOGY										
Neg	Destruction of habitat due to visitor activity	2	3	4	2	High	6: Medium		3: Low-medium	▪ Appoint an ECO during operational

								• Strict access control and visual security (cameras) that enables identification of visitors • Visitors' rules to include penalties for not remaining in the designated recreational areas, especially on the ridge and rocky outcrops • Limited number of visitors will be allowed on the ridge at one time (approx. 200 at restaurant and luge combined). • Declared weed and invader species must be removed as per EMP and Ecological Management Plan. • Spills and waste should be immediately cleaned up/removed. Spill kit on site. • Any disturbed, denuded or eroded areas noted must be rehabilitated to avoid progressive habitat degradation		phase to ensure compliance with the EMP, Ecological Management Plan and authorizations ▪ Appoint ecologist to do habitat assessments and updating of the Ecological Management Plan ▪ Implement Rehabilitation measures where required as per EMP
Pos	Protection of habitat: no-go areas	2	5	4	5	Med	9: High		**2: Low**	
Neg	Loss of SCC (theft of individuals), TOP species and invertebrates	2	3	4	2	High	6: Medium		3: Low-medium	
Pos	Protection of SCC: access control and no-go areas	2	5	4	5	Med	9: High		**2: Low**	
Neg	Proliferation of alien vegetation	2	4	4	4	High	7: Med-high		4: Low-medium	
Pos	Long-term alien plant control program: Ecological Management Plan	2	5	4	5	Med	9: High		**3: Low-medium**	
Neg	Bush densification from altered ecological processes	2	4	4	4	High	7: Med-high		4: Low-medium	
Pos	Long-term bush densification management	2	5	4	5	Med	9: High		**3: Low-medium**	

	programme: Ecological Management Plan									
Neg	Soil contamination	2	3	4	2	High	6: Medium		3: Low-medium	
Neg	Soil erosion, compaction & creation of preferential flow paths	2	3	4	2	High	6: Medium		4: Low-medium	
TERRESTRIAL ECOSYSTEM IMPACT SCORE							**6: Medium**		**4: Low-medium**	
ADJUSTED TERRESTRIAL ECOSYSTEM SCORE							**4: Low-medium**		**2: Low**	
AQUATIC ECOSYSTEMS										
Neg	Geomorphology: Sedimentation	3	3	3	3	Med	6: Medium	• Inspection of SUDS and other SWMP structures for damage and erosion after heavy rainfall events. • Avoid hydrocarbon and other hazardous or polluting material spills (from restaurant and ablution) on site – waste management. • Ongoing vegetation cover management as per Ecological Management Plan • Domestic wastewater: report all sewer and water leaks to council	3: Low-medium	▪ Strict erosion control measures must be implemented during the construction/installation and rehabilitation must continue after installation. ▪ Appoint an ECO during construction to ensure compliance with the EMP and authorizations
Neg	Water Quality	4	3	3	4	High	7: Med-high		4: Low-medium	
Neg	Hydrology	3	3	3	3	High	6: Medium		3: Low-medium	
Neg	Habitat & biota	2	3	3	3	Low	6: Medium		3: Low-medium	

								immediately and provide the reference number to the ward councillor for escalation.		▪ Ongoing monitoring and management as per EMP to be implemented by the school
AQUATIC ECOSYSTEM IMPACT SCORE							**6: Medium**		**3: Low-medium**	
WATER RESOURCES										
Neg	Groundwater Resource	3	4	3	2	Low	6: Medium	• Avoid soil contamination • Ensure SWMP measures are effectively attenuating and settling runoff from the site • Prevent and control erosion	3: Low-medium	External audits to be done as per EMP.
Neg	Hydrology	3	3	3	3	Low	6: Medium		3: Low-medium	
WATER RESOURCES IMPACT SCORE							6: Medium		3: Low-medium	
HERITAGE RESOURCES										
Neg	Destruction of stonewalled heritage sites	2	5	3	2	High	6: Medium	• 15m buffers around 3 stone walls need to be designated as no-go areas for visitors	3: Low	If the buffer zone of 15m is implemented the risk is low.
HERITAGE RESOURCES IMPACT SCORE							**6: Medium**		**2: Low**	
SOCIAL ASPECTS										
Neg	Impacts on religious activities on site	2	2	3	3	High	5: Medium	• Access for religious purposes to individuals currently visit the site	2: Low	If mitigation is not implemented, religious

								and want to apply for access, will be provided access and visitor's rules will apply.		users of the site will likely use the adjacent vacant properties, as these are similar in character.
SOCIAL ASPECTS IMPACT SCORE							**5: Medium**		**2: Low**	
WASTE MANAGEMENT										
Neg	Soil/water/air pollution due to improper waste handling, storage and disposal	3	2	4	4	High	7: Med-high	• General waste on site must be effectively controlled. • Backup waste removal services must be used if municipal waste removal has not taken place. • Visitors rules to include penalties for littering or polluting • Waste sorting bins must be provided and recycling implemented.	: Low-medium	With the implementation of mitigation methods all impacts can be prevented.
WASTE MANAGEMENT IMPACT SCORE							**7: Med-high**		**3: Low-medium**	
NOISE										
Neg	Nuisance to visitors and neighbouring residents	3	1	3	3	Low	5: Low-Medium	• Operational phase noise from visitor activity may exceed ambient noise	2: Low	Noise caused by visitors and carts is

	from construction activities.							levels occasionally but will be restricted to operating hours. • Cart noise is expected to be from 46 decibels at 20km/h to 76 decibels with 4 carts at 20 – 25km/h (with ambient noise of 33 decibels)		expected to be of minimal impact compared to R82 contribution to ambient noise level.
NOISE IMPACT SCORE							**5: Low-Medium**		**2: Low**	
TRAFFIC										
Neg	Increased traffic in the project area and in the region	3	1	3	3	Low	5: Low-Medium	• Access will be from the R82 at Pierpont Drive, an existing intersection on the double duel-carriageway with traffic lights and turning lane to accommodate visitor traffic.	2: Low	Traffic is not expected to be significantly impacted.
Neg	Risks to the safety of pedestrians and road users	3	1	3	3	Low	5: Low-Medium		2: Low	Normal road rules and precautions apply.
TRAFFIC IMPACT SCORE							**5: Low-Medium**		**2: Low**	

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

- Vegetation Assessment
- Terrestrial Fauna Assessment
- Aquatic Risk Assessment
- Heritage Impact Assessment
- Social Assessment
- Geotechnical Report
- OSR
- Masterplan report
- SWMP

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

It is assumed that all mitigation measures will be implemented as stipulated in the EMPr during the construction phase, as well as the operational phase as specified respectively, and that visitors will be mindful of the visitor's rules and the site sensitivities.

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.

Should the proposed facility be decommissioned, similar impacts are anticipated as indicated during the construction phase, including vegetation clearing, erosion, alien invasives species spread, harvesting of SCC, damage to heritage resources, impacts on nearby watercourse.

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

- Vegetation Assessment
- Terrestrial Fauna Assessment
- Aquatic Risk Assessment
- Heritage Impact Assessment
- Social Assessment
- Geotechnical Report
- OSR
- Masterplan report
- SWMP

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

Not applicable.

4. CUMULATIVE IMPACTS

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

Impacts on water resources: Due to the urban densification of the catchment in which the watercourse is situated, as well as related impacts of surface hardening, fragmentation of connectivity by linear structures like roads and urban runoff, the cumulative impacts of erosion, sedimentation and water quality degradation can temporarily be expected from this project during the construction phase, if mitigation measures are not implemented.
Impacts on habitat, vegetation & SCC: Increasing pressures of informal settlement, informal recycling sorting areas and formal land use changes, the cumulative impact may result in a decline of the extent of the Klipriver Highveld Grassland if mitigation measures are not implemented. However, if the status quo is maintained, further degradation of the habitat and illegal harvesting of Vulnerable SCC plants will continue.

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.

Preferred Alternative: Mountain Fun Park with Concrete Luge Track

The goals of this project are to provide an adrenalin-based tourism facility that facilitates multiple participants at a time, with supporting and ancillary facilities that provides financial viability, and to dedicate 89% of the land, including SCC populations and sensitive habitat, social and heritage features, to management for conservation by means of monitoring and adaptive management.

The impacts of the construction phase of the proposed project are expected to be temporary and minimal, and can be managed effectively through mitigation measures as provided in the EMP. Mitigation of impacts during the operational phase include measures such as strict access, pedestrian movement control, limited number of visitors at the facilities on the ridge, as well as stormwater and waste management. An Ecological Management Plan will be developed for the property and will contribute to the improvement of vegetation cover and species composition by erosion control, alien invasive plant eradication and other specialist recommendations. Monitoring by an ECO during construction and operation as indicated by the EMPr for each aspect and its respective impacts.

Water resources
Impacts: potential erosion, sedimentation and pollution of stormwater from the site draining into the channeled valley bottom wetland on the opposite side of the R82.
Mitigation: SUDS measures including permeable parking, erosion control and bioswales.

Vegetation & SCC
Impacts: destruction and/or removal of SCC during construction
Mitigation: layout was amended to minimally intercept the SCC localities; prior to construction: fencing off population clumps and relocate individual specimens to the nearest clump on site where required. Construction footprint must remain within the proposed operational footprint as far as possible.

Fauna
Impacts: destruction of habitat, limiting of faunal movement
Mitigation: footprint was minimized to impact minimally on habitat sensitivities and fencing will be palisade as recommended by GDARD.

Heritage
Impacts: destruction of heritage features during construction
Mitigation: the potential grave is in the wetland area excluded from development; once access control is established on site, the area where stone walling is located will be cordoned off as a no-go zone during construction. The proposed tracks and infrastructure will not intercept the stone wall features and the 15m buffer.

Social
Impacts: The ridge and cave areas that are visited for religious purposes will be less accessible to current site visitors.
Mitigation: Access will be granted to visitors for religious purposes on application and visitor's rules will apply.

Cumulative
Other recent developments on the same Class 2 ridge include Thaba Eco Estate (2021), Southgate Ridge Security Estate (2013); Eagles Nest Residential and Hospitality development (2008), Rietvlei zoo Farm school (2004); Rand Water Headquarters (2004); Thaba Eco Hotel (2007, 2009) . It is expected that the approx. 12 000 units (8701 shown on current live availability map) of Thaba Eco Estate will have a highly significant impact on current services capacity in the area. The proposed Mountain Fun Park is expecting to have a low impact on services and aligns with the Provincial and Local development goals for the area, which includes low impact tourism activities.

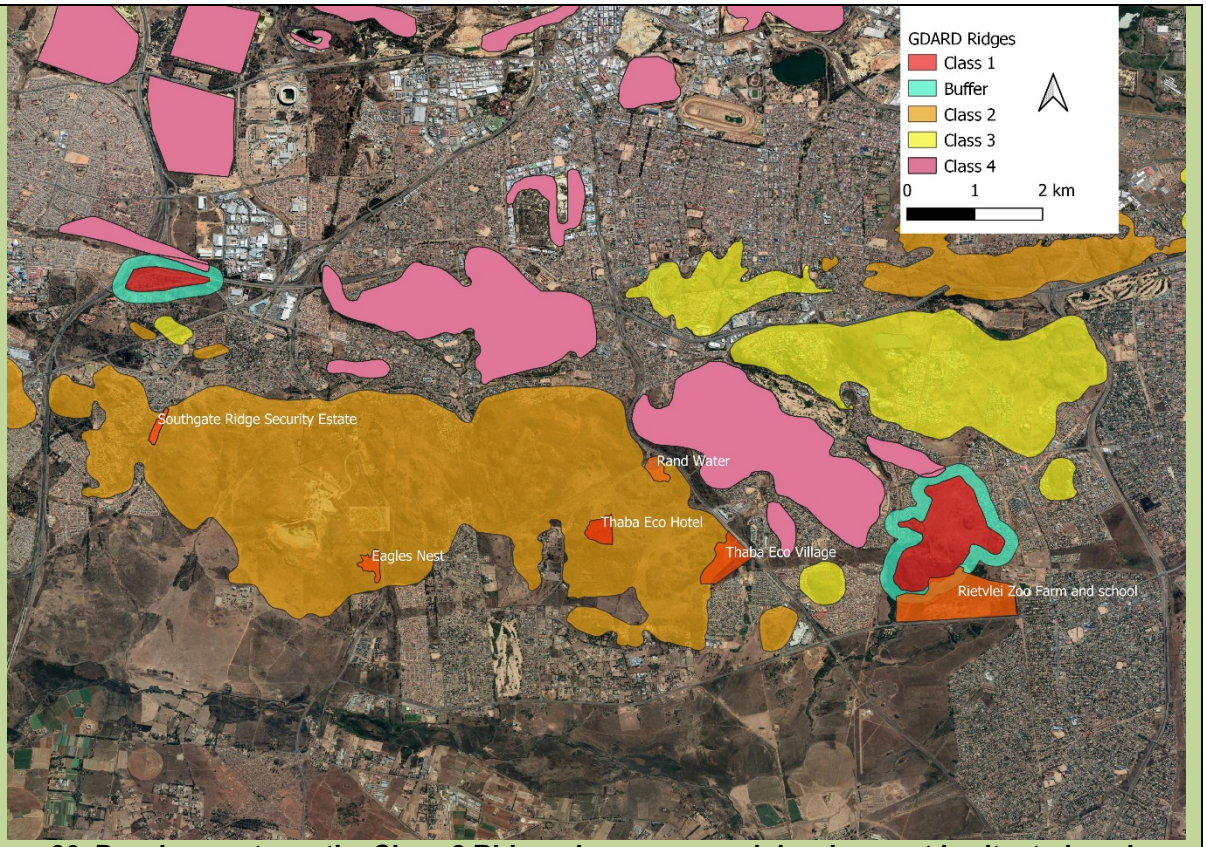


Figure 30. Developments on the Class 2 Ridge where proposed development is situated, and adjacent Class 1 buffer.

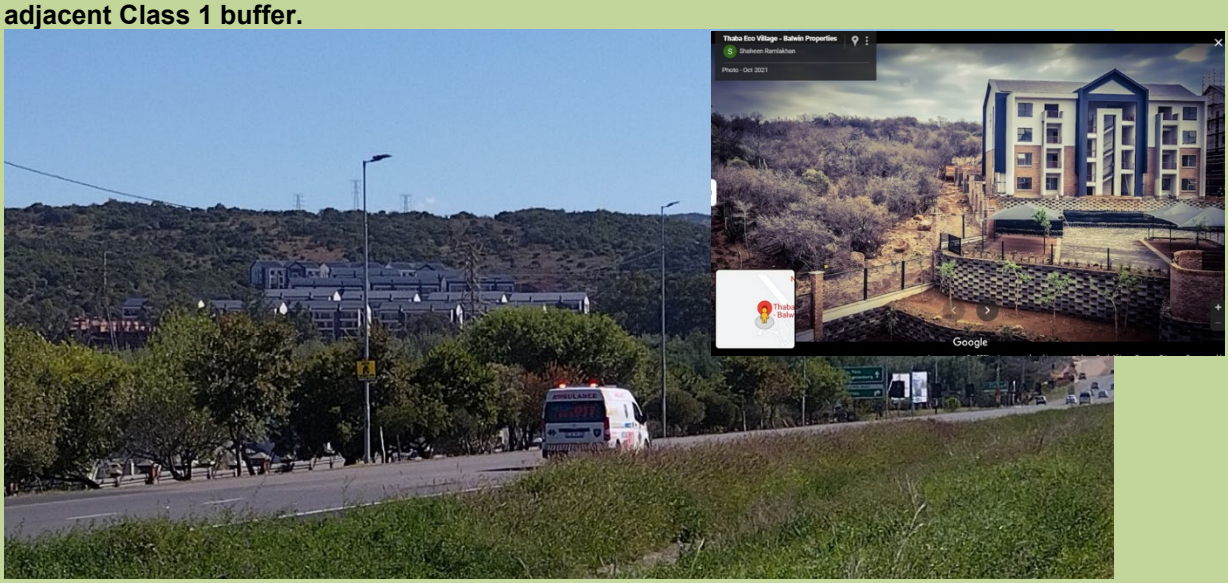


Figure 31. Other developments on the Class 2 Ridge: Thaba Eco Village.

Figure 32. Other developments on the Class 2 Ridge: Eagle's Nest residential and hospitality.

Figure 33. Other developments on the Class 2 Ridge: Rietvlei Zoo farm and schools.

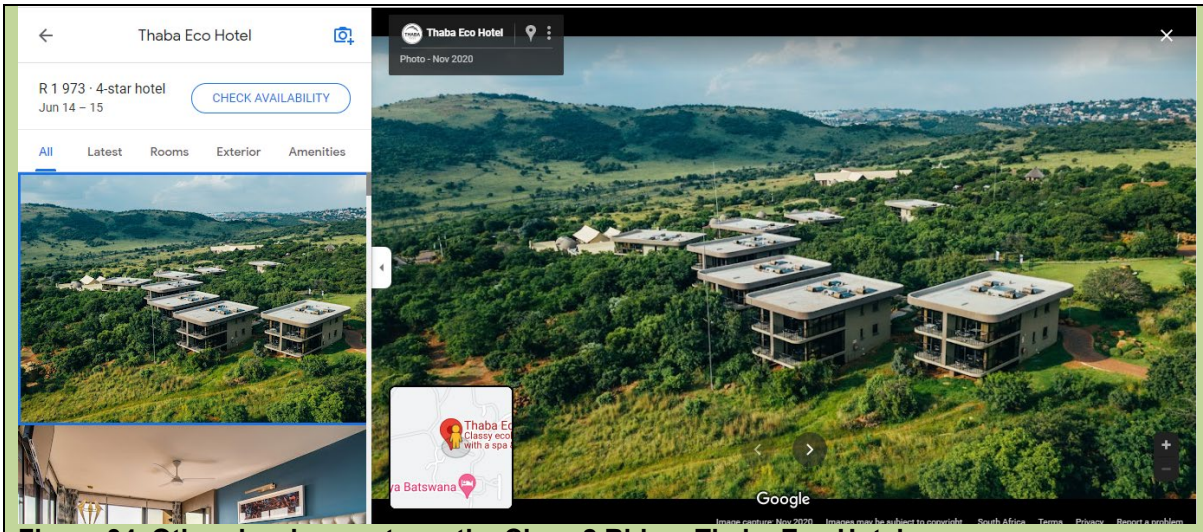


Figure 34. Other developments on the Class 2 Ridge: Thaba Eco Hotel.

Alternative 1: Layout 1 (sensitivities not yet considered)

Higher impacts on the SCC, vegetation, fauna and heritage resources than the Preferred Alternative, as the interception of sensitive aspects were not minimized with this layout.

No-go (compulsory)

Should the site be left undeveloped and the protection of the SCC and vegetation not take place, the current status quo will continue including:

- Uncontrolled litter and firewood harvesting
- Uncontrolled fires
- Uncontrolled illegal harvesting of SCC
- Vegetation structure and species composition change over time
- Alien invasive vegetation spread
- No educational or economic value

6. IMPACT SUMMARY OF THE PROPOSAL OR PREFERRED ALTERNATIVE

For proposal:

The impacts of the construction phase of the proposed project are expected to be temporary and minimal, and can be managed effectively through mitigation measures as provided in the EMP. Mitigation of impacts during the operational phase include measures such as strict access, visitor movement control, limited number of visitors at the facilities on the ridge, stormwater and waste management. An Ecological Management Plan will be developed to manage the ecological resources on site. Monitoring by an ECO during construction and operation as indicated by the EMPr for each aspect and its respective impacts.

For alternative:

See section 5 (above)

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.

Layout was amended to minimally intercept the SCC localities

Vegetation, SCC and habitat will be managed for conservation
SWMP will include SUDS measures
Environmental education opportunities are created
Monitoring and adaptive management under ECO guidance can improve indigenous vegetation cover
Ecological Management Plan for the conservation of habitat type

7. SPATIAL DEVELOPMENT TOOLS

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

A Geographic Information System (QGIS) was utilized to identify areas of biodiversity concern that may be affected by the proposed development. GDARD C-plan and CoJ Spatial Development Framework, as well as DEA Screening tool report were used to identify sensitivities and specialist studies required.

8. RECOMMENDATION OF THE PRACTITIONER

Is the information contained in this report and the documentation attached hereto sufficient to make a decision in respect of the activity applied for (in the view of the Environmental Assessment Practitioner as bound by professional ethical standards and the code of conduct of EAPASA).	**YES x**	NO

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:

Refer to EMPr

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

The project provides a multi-participant adrenalin-based activity while accommodating the ecological objectives.

The project aligns with the goals of the:

- GDARD Ridges guideline:
  - footprint - although 5% of property is recommended to be developed on Ridge Class 2, the ecological and conservation benefits of the ongoing management during the operational phase will contribute significantly if compared to the No-go option of continued status quo. The additional footprint is required for the ancillary services in order to be financially viable.
  - Land use – tourism, low impact activity
- CoJ Stormwater guideline: SUDS measures included in the SWMP
- CoJ IDP 2021/22: The IDP Waste Management programme aims to reduce environmental pollution, water and soil contamination, gas, odour, and potential fire hazards as a result of burning of solid waste. The proposed development will contribute positively to this goal. The proposed project links with the environmental education goal by means of the environmental info at the visitor centre. Tourism Development is indicated as supporting function to "ensure and monitor compliance with appropriate environmental and heritage management legislation in respect to tourism development and operations", which is addressed by the EMPr and Ecological Management Plan monitoring, auditing and reporting requirements. The impact of COVID 19 is discussed in the IDP and actions include "providing stimulus and accelerating recovery", under which "mainstream environmental sustainability" is listed as a guiding principle. Sustainable Environment Development is also listed as a strategic priority in the IDP. The proposed development fulfills this goal. The project contributes to the IDP goal of resilience, which, as part of creating integrated living spaces, is to protect the open

space system as a buffer and to protect biodiversity and green infrastructure. Environmental degradation is listed as a Top Strategic Risk of CoJ and the proposed project will achieve this on site by means of access control and EMPr management measures.

- CoJ Growth and Development Strategy 2040: The GDS refers to resilience, sustainability and liveability as being about "Johannesburg's ability to manage its resource scarcity, ensuring that decisions and actions hold the least harm for the environment, while delivering on a realistic set of service responsibilities". The proposed project is considered resilient and sustainable due to the small footprint, proposed management of ecological no-go area and low energy use.
- Environmental Sustainability Strategy and Action Plan for CoJ 2019: The proposed project will also contribute to managing valuable ecological resources that are under increasing pressure and are not adequately valued, protected or managed. The sustainable management of urban drainage to reduce damage to receiving environment and improved water quality, as part of Objectives 4 and 5 of the ESS, will be achieved on site with SUDS in the SWMP. Improved environmental awareness and accountability is also proposed as part of the functions of the facility by means of environmental education info at the visitor center.

The project offers an opportunity to conserve and monitor the vegetation and SCC on the site. Furthermore, construction phase impacts can be minimised and mitigated and operational phase positive impacts contribute to conservation goals.

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

10 years

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

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

EMPr attached	**Yes**

SECTION F: APPENDIXES

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

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

Appendix A: Site plan(s) – *(must include a scaled layout plan of the proposed activities overlain on the site sensitivities indicating areas to be avoided including buffers)*

A1: Master layout with sensitivities
A2: Amended layout
A3: Layout 1 (Alternative 1)
A4: Vegetation sensitivity overlaid
A5: Fauna sensitivity overlaid
A6: Wetland sensitivity overlaid
A7: Heritage and Social sensitivity overlaid

Appendix B: Photographs – Photographic Report

Appendix C: Facility illustration(s) – **Masterplan (GAPP, 2022)**

Appendix D: Route position information **– N/A**

Appendix E: Public participation information

Annexure E1 – Proof of site notice

Annexure E2 – Written notices issued as required in terms of the regulations

Annexure E3 – Proof of newspaper advertisements

Annexure E4 –Communications to and from interested and affected parties

Annexure E5 – Minutes of any public and/or stakeholder meetings

Annexure E6 - Comments and Responses Report

Annexure E7 –Comments from I&APs on BA Report **– refer to E6**

Annexure E8 –Comments from I&APs on amendments to BAR **– N/A**

Annexure E9 – Copy of the register of I&APs

Annexure E10 – Comments from I&APs on the application **– in E6**

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

DWS WULA: e-Wulaas application proof of submission to DWS attached.

Appendix G: Specialist reports

Annexure G1: Vegetation Assessment
Annexure G2: Fauna Assessment
Annexure G3: Wetland Assessment
Annexure G4: Heritage Impact Assessment
Annexure G5: Social Assessment
Annexure G6: Stormwater Layout Plan
Annexure G7: Geotechnical Report
Annexure G8: Services layouts (water & sewer)

Appendix H: EMPr