

IN TOUCH WITH THE AFRICAN LANDSCAPE

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FINAL BASIC ASSESSMENT REPORT  
IN TERMS OF THE ENVIRONMENTAL IMPACT ASSESSMENT  
REGULATIONS 2010, PROMULGATED IN TERMS OF THE NATIONAL  
ENVIRONMENTAL MANAGEMENT ACT, 1998 (ACT 107 OF 1998) AS  
AMENDED.

PROPOSED DEVELOPMENT OF PART OF THE REMAINDER OF  
PORTION 39 AND PORTION 55 OF THE FARM TOWNLANDS OF  
LYDENBURG 431-JT

GUSTAV KLINGBIEL RESERVE

**REF 17/2/3/E-45**

PREPARED FOR  
GROUP FIVE CONSORTIUM

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## **INTRODUCTION**

### **1.1. Background to the Project**

The Gustav Klingbiel Nature Reserve is a proclaimed Nature Reserve and is owned and managed by the Thaba Chweu Municipality in collaboration with an Advisory Committee. The biodiversity of the reserve is still relatively intact and is considered important and necessary from an Environmental Management perspective. The existing facilities in the reserve are poorly maintained mainly as a result of a lack of funds. The Reserve is under utilized, under managed and under staffed. Maintenance of the roads is poor and the habitat is in parts, badly eroded and invaded with exotics.

The existing facilities, which are regarded as high impact public areas, are located in the south-western peripheral part of the reserve. The south western part of the reserve has already been compromised from an environmental point of view and provides an opportunity for the establishment of additional tourism opportunities. The introduction of additional tourism uses at this location will have a minimal impact on the biodiversity of the rest of the Reserve. The balance of the southern peripheral part of the reserve next to the National Road is also used for other public activities such as 4x4 vehicle and mountain biking trials.

Three other environmentally comprised areas were identified in the north-eastern (non-public) part of the reserve by the environmental specialists. These areas, which have been compromised as a result of overgrazing by game and erosion, were identified as potentially being suitable for the establishment of more exclusive corporate lodges. An assessment of these alternate sites is more fully addressed later in this report.

Engineering services are virtually non-existent in the reserve. The south-western corner could potentially be serviced from the adjoining residential township to the west. Any development in the more remote north-eastern part would have to rely on more localised compact engineering solutions for water, sewerage and electrical services.

These conditions reveal that there is an opportunity for intervention in the Reserve, specifically to ensure its long term ecological and biodiversity sustainability for the realisation of both social and economic benefits to the surrounding community.

#### **Tender Process**

With a view to achieving the above, in 2008 the Thaba Chweu Municipality, which is the registered owner of the Gustav Klingbiel Nature Reserve, Lydenburg and of which the application site forms a part, awarded a tender to the Group Five Consortium. The purpose of the tender by the Council was to establish a hotel and tourism related facilities in the south west corner of the Gustav Klingbiel Nature Reserve, adjoining the museum. Integral to the applicant's agreement with the Council, is the upgrading of the Lydenburg museum.

Due to the growing demand for tourism facilities in this area, the Council initiated this project as a joint venture with the private sector, ie. the applicant, in order to accommodate this growing need and demand.

Group Five Consortium, hereafter referred to as the "applicant," is, therefore, making application to the Mpumalanga Provincial Department of Economic Development, Environment and Tourism for environmental authorisation in terms of the Environmental Impact Assessment Regulations 2010, promulgated in terms of the National Environmental Management Act 1998 (107 of 1998) as Amended, for the above.

The application for authorisation is, therefore, for the development of tourism related facilities to be located on Part of the Remainder of Portion 39 and Portion 55 of the Farm Townlands and of Lydenburg 431-JT, which forms a small part of the Gustav Klingbiel Nature Reserve.

## **1.2. Scope of Environmental Investigations**

This document and other appendixes attached are a result of detailed and holistic investigations. These were undertaken for the purpose of environmental and social investigations of the possible impacts that are likely to emanate as a result of the development of the proposed retail centre.

The concept of sustainability underpinning this Environmental Impact Assessment considers three interrelated dimensions of the environment, the social, economic and biophysical dimensions. For an option or project to be sustainable, it needs to demonstrate economic viability, social equity and soundness, and ecological integrity within a framework of good governance. All three of these dimensions of sustainability need to be taken into account when assessing a proposed option or project, taking due cognisance that the three dimensions are seldom in perfect balance, often dictated by local circumstances.

Key sustainable principles

- Development must not irretrievably degrade the natural, built, socio-economic resources on which it is based.
- Where there is uncertainty about the impact of activities on the environment, caution should be exercised in favour of the environment.
- Land use and environmental planning need to be integrated.
- Immediate and long-term actions need to be identified and planned for, so that urgent needs can be met while still progressing towards longer-term sustainable solutions.

## **2. PROJECT DESCRIPTION**

### **2.1. Location**

The proposed development is to be located on a Part of the Remainder of Portion 39 and Portion 55 of the Farm Townlands and of Lydenburg 431-JT, which forms a small part of the Gustav Klingbiel Nature Reserve. The original application site, over which the ecological surveys were done, is approximately 25 hectares inside the Gustav Klingbiel Nature Reserve, located immediately to the east of and adjoining the eastern boundary of The Heads development, with the R37 forming the southern boundary, Lydenburg. The Lydenburg Museum is located within the site. Subsequent to the original survey, the “application site” has been reduced to an area of 7.4 hectares. Refer **Appendix B: Site Locality Plan and Actual Development Area**

### **2.2. The Site**

The application site on which the surveys were undertaken, is approximately 25 hectares of the Gustav Klingbiel Nature Reserve, comprising of a mix of vegetation types, which will be more fully discussed later in this report. The greater portion of the site comprises of grassland and the northern extent of riverine vegetation. The Lydenburg Museum is located within the site, on its southern boundary and there are a number of dirt roads and tracks traversing the site, which serve as public access within the reserve. The main track

through the site crosses over the stream to an existing lapa on the reserve. The “application site” is an area of 7.4 hectares, located adjoining the R37 and the Museum **Appendix C: Site Photographs** provide a series of photographs taken from the centre of the site at the eight points of the compass.

### 2.3. Description of the project

It is intended that a part of the 7.4 hectare application site will be developed with tourism related facilities, including museum and related facilities, hotel including spa, conference facilities, bar, restaurants, sports and recreation facilities, tourism related accommodation (lodges), caravan park and related facilities and picnic areas. Development of these facilities will be limited to around the museum area and adjoining the R37 road.

**Appendix D: Facility Illustration – Development Proposal** indicates the footprint position of the hotel, conference centre and other related facilities, east of the Museum, adjoining the R37 road. Also **Appendix D: Master Plan Facility Layout** provides a more detailed, but conceptual idea of the position of the facilities and the layout of the structures.

The remainder of the original application site will remain undeveloped and be part of the greater nature reserve area.

Access to the site will be via the existing entrance to the Lydenburg Museum. In terms of the detailed planning controls, the following is applicable. The development of the site will comprise of 4 Erven, as follows

Description	Approximate Area (hectares)
Building development footprint area	7.4787
<b>Total</b>	<b>7.4787</b>

Proposed controls for the development will be as follows

Height	not exceeding 2 storeys
Coverage	will not exceed 8%
Floor Area Ratio	will not exceed 0.08
General	

1. The hotel will not exceed 120 rooms
2. Access will be provided to the satisfaction of the South African National Roads Authority and the Municipality
3. A Site Development Plan shall be prepared for the site and submitted to the Local Authority for approval

As may be determined from the above development controls, the total area of constructed floor area of the development / transformation on the site will not exceed  $\pm 20\,000\text{m}^2$ , ie  $\pm 2$  hectares of the  $\pm 7$  hectare development footprint site. The remainder of the application site will remain undeveloped as part of the greater Gustav Klingbiel Nature Reserve.

Access to the application site for the general public will be retained via the existing Museum access point, in order to visit the museum, to utilise the picnic areas and to access the tourist roads within the reserve. Access to the hotel and self catering lodges will be controlled with access available to staying visitors.

### **Services**

A specialist services report has been prepared and which is contained in **Appendix F.01: Gustav Klingbiel Services Report**. A summary of the findings in the report note the following

Water – there are currently 8 boreholes on the site which fill the 20 000 litre water tank adjacent to the museum. The engineers have ascertained the volumes from the boreholes to be sufficient to supply the proposed facilities. An alternative supply would be from the reservoir on the adjoining property, 150m to the west of the museum.

Sewer – There is an existing sewer for the museum which links to the Lydenburg Municipal sewage system. The report notes that this can also be utilised for the proposed new facilities. Calculations indicate that the volumes would be able to be accommodated in the Lydenburg system.

The engineers have indicated that the calculated peak discharge of 1.4 litres per second will not affect the Council sewer,

Electricity - A specialist electrical services report has been prepared and which is contained in **Appendix F.02: Electricity Report**. A summary of the findings in the report note the following

The Council is in the process of upgrading their bulk supplies from Eskom, which resulted in a new intake substation, which has still not been commissioned. This will contribute to reducing loads on the existing “Town substation” which will be transferred to the new substation. The supply to the proposed development will therefore, be provided from the “Town substation”. The development will require the installation of an underground cable.

### **Traffic and Access**

A specialist traffic impactd report has been prepared and which is contained in **Appendix F.03: Traffic Assessment Report**. A summary of the findings in the report note the following:

The study investigated the current situation with regards to peak traffic volumes in the area and modelled a scenario of anticipated volumes for the area without the proposed development. The study then assessed the envisaged volumes, trip generation and trip distribution of traffic and its assignment to the network. The anticipated volumes envisage 113 vehicle trips in the morning peak and 127 trips in the afternoon peak. These volumes were then assessed by modelling, the impact of this additional traffic on the road network.

The report indicates the levels of service that would be expected once the development has reached full capacity and it was determined that the intersections would be operating at acceptable levels of service.

A projection to the year 2015 was also undertaken and determined that these same intersections would still be operating at acceptable levels of service.

The report discusses the access to the reserve, which is to be at the same access point as the Lydenburg Museum, ie off the R37.

## Regulations of NEMA

The Applicant is applying for the following listed activities in terms of the 2010 Regulations

Indicate the number and date of the relevant notice:	Activity No (s) (in terms of the relevant notice) :	Describe each listed activity as per the detailed project description (and not as per wording of the relevant Government Notice) <sup>1</sup> :
546, 18 June 2010	4	The construction of internal access roads that may exceed 4 metres
545, 18 June 2010	6	The construction of the identified tourism resorts, lodges and other tourism accommodation facilities that will accommodate more that 15 people
545, 18 June 2010	12	The clearance of an area of 300 m <sup>2</sup> or more of vegetation where 75% or more of the vegetative cover constitutes indigenous vegetation for the purposes of constructing and erecting the tourism facilities, roads, etc
545, 18 June 2010	13	The clearance of an area of 1 hectare or more of vegetation where 75% or more of the vegetative cover constitutes indigenous vegetation for the purposes of constructing and erecting the tourism facilities, roads, etc

## 2.4. Project Alternatives

In 2008 an investigation of the Reserve was undertaken with the specific purpose of identifying development opportunities in the Reserve and, in particular, sites for the development of tourism facilities and associated infrastructure. The findings of this survey are reflected below

### 2.4.1 Sensitive Areas of the Reserve

The entire Reserve comprises highly sensitivity habitat, primarily contained within the habitat categories summarized below.

The **Lydenburg Montane Grassland** areas are extremely sensitive and have a high conservation value, due to the rich biodiversity of species and also the low percentage of this habitat under conservation. This habitat occurs mainly on the slopes of the north-eastern section of the reserve, which also offer suitable habitat for the following Red Data bird species including secretary birds (near-threatened), Blue Crane (vulnerable), Denham's (Stanley) Bustard (vulnerable), Whitebellied Korhaan (vulnerable) and Cape Griffon (vulture) (vulnerable). No structured development, roads or infrastructure should be permitted in these areas. Permissible nature based activities would include hiking, bird watching, mountain biking and bridle trails.

The **rocky cliffs and Krugerkloof** which contains unique vegetation as well as habitats for threatened flora and fauna, including potential breeding sites for Red Data species such as the southern bald ibis (vulnerable) as well as suitable habitat for African rock python (vulnerable). No structured development, roads or infrastructure should be permitted in these areas. Permissible nature based activities would include hiking, bird watching, mountain biking and bridle trails.

**Wetland habitats** including klipgatspruit; Potloodspruit, hillslope seeps and drainage lines. Potential habitat for the Rough-haired Golden Mole (endangered), Marsh Sylph butterfly (vulnerable) and Half-collared Kingfisher (near-threatened). No structured development, roads or infrastructure should be permitted in these areas. Permissible nature based activities would include hiking, mountain biking and bird watching.

The **grassy midlopes and crescents** of the **mountains (Vyekop, Aarbeikop)** on the site offer suitable habitat for Blue Cranes as well as Blackwinged Lapwing (plover) (near-threatened). Permissible nature based activities would include hiking, bird watching, mountain biking and bridle trails.

Approximately one third of the Reserve, in the south and east of the Museum, is already open to public vehicular use, where there are existing roads. Parts of this area are degraded, disturbed and have extensive alien invasion. This area is, therefore, less sensitive and should be retained for public access and use.

Four sites were identified within the Reserve that have the potential for development opportunities, primarily due to these areas being situated in heavily eroded areas or degraded grassland habitats, all of which require immediate conservation intervention, such as erosion stabilizing mechanisms and appropriate revegetation with endemic grass species. The remainder of the Reserve should not be considered for any development options.

#### 2.4.2 Development Opportunities in the Reserve

Four potential development opportunity areas were identified in the Reserve, which are situated in heavily eroded areas or degraded grassland habitats, all of which require immediate conservation intervention, such as erosion stabilizing mechanisms and appropriate revegetation with endemic grass species. Refer **Appendix D.02: Alternative Development Sites**

The sites were identified in accordance with a number of specific criteria, in order to ensure the ecological viability of the locations, as well as to accommodate development and tourist preferences. These include

- Ecological sensitivity – the greater area of the reserve is extremely sensitive and, therefore, only sites situated in heavily eroded areas or degraded grassland habitats, all of which require immediate conservation intervention, such as erosion stabilizing mechanisms and appropriate revegetation, were considered suitable for development
- Wilderness Ambience – the objective of establishing a lodge/ corporate lodges in a natural area, is to allow visitors to feel a true wilderness ambience and



experience. Sites were identified in that were, therefore, located in an area that was isolated and remote

- Visibility – it was considered important that identified sites were not visible from adjoining public roads, nearby housing areas, etc, in order to not impact on the current natural visual status the reserve. This would also ensure limited light pollution from the lodges.
- Views – the location of the sites is also based on endeavouring to achieve a wilderness ambience by ensuring views from the lodges do not encompass existing urban development.
- Access – sites need to be located where there is either existing access or where limited extensions of access can be provided, in order to prevent further impact into the heart of the reserve.
- Services - sites should ideally be located where there are either existing services or where low impact connections can be implemented. There are no services in the heart of the Reserve and, therefore, services would have to be of a low impact, eco-friendly nature.
- Public domain – sites should be located where there is limited impact from the public areas, in order once again, to retain a wilderness and remote, isolated ambience.

The sites identified are set out below

(a) Area adjoining the Lydenburg Museum

The area adjoining and immediately to the north of the Lydenburg Museum and access gate to the Reserve, as shown in **Appendix D.02: Alternative Development Sites**, was determined to be far less sensitive than other areas of the Reserve, due to this area having been subject to disturbance and alteration. The “edge effects” of the adjoining development to the west have also contributed to this disturbance. Tourism facilities and related activities are considered suitable in this area. Such facilities could include a moderate scale hotel development, caravanning and camping sites and public day picnic facilities. As this area is in closer proximity to linkage with municipal services, a high level of service infrastructure can be supported. The establishment of this node should not extend into the wetland area or northwards beyond the wetland system.

(b) Site 1 Centre of the Reserve

Site 1 located within the heart of the Reserve was identified at the preferred alternative for the establishment of an “upmarket” game lodge facility or for “corporate lodges”. The site for this facility has been identified to be disturbed and degraded as a result of erosion, with disturbed grasslands. The site extends along the southern banks of the stream on its north facing banks. The site meets the criteria for an upmarket lodge/lodges in terms of wilderness ambience, is not visible from the surrounding areas, has existing road access and is not close to any public areas. There are, however, no services of any nature.

(c) Site 2 Centre of the Reserve

Site 2 is also located within the heart of the Reserve and was identified as an alternative development option. This site has also been identified to be disturbed and degraded as a result of erosion, with disturbed grasslands. The site extends along the southern banks of the stream on its north facing banks, further to the west of Site 1. The site meets most of the criteria for an upmarket lodge/lodges in terms of wilderness ambience, is not visible from the surrounding areas, has existing road access and is not close to any public areas. The site will, however, potentially have views of developments and facilities to the west of the Reserve. There are also no services of any nature.

(d) Site 3 Centre of the Reserve

Site 3 is also located within the heart of the Reserve and was identified as an alternative development option. This site has also been identified to be disturbed and degraded as a result of erosion, with disturbed grasslands. The site extends along the south eastern slopes of the Arbeidskop hill. This site partly meets the criteria for an upmarket lodge/lodges, as it is close to existing road access and is not close to any public areas. The site will, however, be visible from the southern areas of the Reserve and overlooks the town of Lydenburg, thus negating any wilderness atmosphere. There are also no services of any nature.

#### 2.4.3 Assessment of Alternatives

It was noted that that the implementation of tourist facilities and associated infrastructure on any of the identified development sites, has the potential to alter or fragment these areas on site and would have negative implications for the environment. In assessing the alternatives, specific threats to the ecological attributes of the reserve were taken into consideration, which included

- Destruction of important faunal habitat
- The loss of foraging or feeding habitat – both through the construction of the upmarket lodge, and through the construction of associated infrastructure.
- The fragmentation of habitat through the development and associated linear infrastructure such as roads, and overhead powerlines.
- Increased disturbance levels – both during construction and as a result of increased occupancy on site once construction is complete.

Clearly, based on the above, a site adjoining the Museum would have the least impact on the greater Reserve area, its habitat and the ecological attributes. This site has already been largely disturbed and, therefore, would not contribute to any significant loss of important habitat ; it is located on the edge of the Reserve and therefore, its development would ensure no invasion of linear disturbance from roads and services ; it does not contribute to habitat fragmentation.

Most importantly, the development proposal can be achieved, subject to further scientific ecological and heritage evaluation, without significant impact to the functioning of the reserve **and** contribute to the economic sustainability of the Reserve and the local tourism industry.

On the basis of the above and as part of a Council process, which does not form part of this application, the application site was selected as the preferred alternative for development of tourism opportunities.

#### 2.4.4 Need and Desirability of the Development

Although the Gustav Klingbiel Nature Reserve is owned, managed and operated by the Thaba Chweu Local Municipality, it has for some time, been facing difficult financial circumstances. Operating budgets are low and tourism visitor numbers to the reserve are poor. These conditions have contributed to financial hardships in sustaining the reserve.

The agreement structured between the Thaba Chweu Local Municipality and the applicant for the proposed development of new and additional tourism facilities in the Reserve, is seen as a major and important opportunity to improve both visitor numbers and also income into the Reserve. The development concept envisages a range of different tourism facilities, including a middle market hotel, caravan sites and picnicking for day visitors. This diverse range of facilities will appeal to a range of income levels in the community that can utilise the Reserve. Anticipated income is envisaged to be utilised for the upgrade of the reserve and for its operation and management.

The development proposal, therefore, has positive implications as it is aimed at contributing to the long term financial and ecological sustainability of the Gustav Klingbiel Nature Reserve.

### 2.5. Description of the Environment

#### 2.5.1. Topography

The site slopes gently downwards from the museum towards the riverine area at the northern end of the application site. Slopes are in the order of approximately 1:20.

#### 2.5.2 Vegetation

A specialist vegetation investigation was undertaken on the conditions on the site, which is contained in **Appendix G.01: An Environmental Report on the Vegetation of Portion 55 and a Part of Portion 93 of the Farm Townlands of Lydenburg 431-JT**. A summary of the findings is set out below:

The site comprises of 5 identified vegetation units:

##### 1. Riverine area

This vegetation unit is located on the northern boundary of the study area and comprises a perennial stream with various drainage channels flowing parallel and towards the stream. This has resulted in a mixture of terrestrial vegetation and moist-loving species growing in a mosaic distribution pattern. This unit therefore includes embankment areas alongside the various channels. The vegetation is characterised by the prominence of the trees *Acacia karroo*; *Diospyros lycioides*; and *Euclea crispa*; and the grasses *Hyparrhenia tamba*; *Setaria sphacelata*; *Ischaemum fasciculatum*. Other species prominent include *Lippia javanica*, *Rhus pyroides*, *Leucosidea sericea*, *Themeda triandra*, *Eragrostis curvula* on the embankment areas, and *Paspalum dilatatum*, *Pennisetum thunbergii*, *Ranunculus multifidus*, and *Schoenoplectus corymbosus* in the stream areas.

This open to dense woodland unit is in a relatively natural condition despite some alien plant species present.

## 2. *Diospyros lycioides*-*Acacia karroo* open woodland

This unit is located adjacent to the Riverine unit and comprises terrestrial vegetation with in some areas signs of moist/shade-loving species.

The woody vegetation is dominated by the tall shrub *Diospyros lycioides* and the tree *Acacia karroo*, while the herbaceous layer is dominated by the tall grass *Hyparrhenia tamba*. Other species also present include *Diospyros whyteana*, *Rhus pyroides*, *Panicum maximum*, *Themeda triandra*, *Chamaecrista mimmosoides*, *Achyranthes sicula*, and *Senecio microglossus*.

The vegetation forms dense bush clumps with open grassland areas in-between. This area links directly with the Riverine unit and comprises mostly terrestrial vegetation with some affinity for moist conditions as indicated by the grasses *Hyparrhenia tamba*, *Sporobolus africanus*, *Urochloa mosambicensis*. The vegetation is slightly disturbed in some areas due to roads and the removal of alien plants.

## 3. *Hyparrhenia tamba* degraded grassland

This mostly level, open grassland consists of mainly grasses and is located in the central and northern part of the study area. The soil is sandy to loamy with some moist patches in-between.

The vegetation is totally dominated by the grass *Hyparrhenia tamba* while the grass *Themeda triandra* is prominent in patches. Small shrublets of *Diospyros lycioides* seem to be encroaching into the grassland in some areas. Other species present include *Acacia karroo*, *Melinis nerviglumis*, *Eragrostis racemosa*, *Nidorella hottentotica*, *Solanum panduriforme*, and *Hypoxis hemerocallidea*.

In the south-eastern section of this unit an *Acacia karroo* tree clump occurs within the tall *Hyparrhenia tamba* grass layer. These trees are relatively tall and no encroachment is taking place.

This grassland was previously grazed but is currently underutilized as indicated by the dominance of the increaser I grass *Hyparrhenia tamba*. In sections the grass layer has become moribund with pioneer species such as *tagetes minuta*, *Pseudognaphalium luteo-album*, and *Conyza bonariensis* prominent

## 4. *Eragrostis curvula*-*Cymbopogon excavatus* grassland

This unit is located in the southern section of the study area. The soil is gravelly and sandy with smaller sections that are moist. The area is relatively flat and slopes slightly towards the north.

The vegetation is dominated by the secondary successional grass *Eragrostis curvula* and *Cymbopogon excavatus*. Other species that are prominent locally include the grasses *Themeda triandra*, *Hyparrhenia filipendula*, and the forbs *Nidorella hottentotica*, *Vernonia oligocephala*, *Zornea milneana*, and *Senecio inornatus*.

This degraded grassland has most probably been cultivated many years ago with the grass *Eragrostis curvula* used as a pasture grass. A human-made channel that

directs water towards the northern part of the study area is also present in this grassland.

## 5. Developed areas

This unit is located in the southern section of the study area, along the western boundary, and a small area in the centre of the study site. These areas have been developed (entrance section in the south) while some have structures and have been used for various other purposes (roads, cultivation, old nursery etc). The vegetation is transformed with very little of the original vegetation present. No red data species or medicinal species were found during the survey.

### Discussion

The following overall evaluation of the vegetation was provided on the status of vegetation in the application land development area.

It is noted that vegetation units (*Hyparrhenia tamba* degraded grassland; *Eragrostis curvula*-*Cymbopogon excavatus* grassland) are mostly homogeneous, dominated by two or three species mainly. These areas have most probably previously been utilized for either grazing or cultivation purposes with mainly secondary successional species present. Although various forb species occur they do not have a high cover and are scattered throughout the units. These units are not in a pristine condition and from an ecological point of view they are regarded as having a low conservation value and ecosystem functioning and have low species and habitat diversity.

The developed area is transformed with a low species diversity and the presence of various planted species. No red data species were found. The area is regarded as having a low conservation value.

Vegetation units 1 & 2 (Riverine area & *Diospyros lycioides*-*Acacia karroo* open woodland) comprises natural vegetation mostly with relatively high species richness. These areas are located in and along the perennial stream and forms part of the riverine vegetation towards the grassland areas. The largest proportion of the vegetation of these two units are representative of climax conditions with little degradation/disturbance evident. Although some alien invaders were observed, they are being controlled by a Working for Water team, while the infestation is localized and in smaller patches. They do however have to be eradicated from these areas. Apart from the vegetation unit 1 has an important ecosystem functioning by channeling and containing water. Thus it can be concluded that from a total ecological point of view these units are regarded as having a high conservation value.

A sensitivity plan has been prepared which maps the areas of sensitive vegetation and which the specialists have recommended should not be developed. Refer **Appendix D.03: Sensitivity Plan**

### **2.5.3 Faunal**

A specialist faunal investigation was undertaken on the conditions on the site, which is contained in **Appendix G.02: Faunal Survey Portion 55 and a Part of Portion 93 of the Farm Townlands of Lydenburg 431-JT**. A summary of the findings is set out below:

The Gustav Klingbiel Nature Reserve provides important habitat for several larger and smaller mammal species. Larger mammal species of which several have been successfully re-introduced include Giraffe, Eland, Plains Zebra, Kudu, Impala, Blue Wildebeest, Oribi, Common Duiker, Grey Rhebok, Reedbuck, Blesbuck, Bushbuck, Bushpigs, Antbears, Black-backed Jackal, Vervet Monkey, Common Warthog and Chacma Baboons.

Red data mammal species which have been recorded or suitable habitat occurs in the reserve include Rough-Haired Golden Mole (Endangered), Highveld Golden Mole (Near-Threatened), Oribi (Endangered), South African Hedgehog (Near-Threatened), Brown Hyaena (Near-Threatened) Aardwolf (Near-Threatened), Ground Pangolin (Near-Threatened), Selous' mongoose (Rare).

An assessment of aardvarks on the applications site indicated that no recent Aardvark burrows or evidence of foraging activities was observed in the degraded grasslands of the site. Extremely limited termite mounds occur in these degraded grasslands. Aardvarks or Antbears have been downgraded from vulnerable to Lower Risk/Least concern.

Suitable refuge as well as foraging habitat exists in the Acacia woodland and riparian zones of the Klipgatspruit for African Hedgehogs.

Pangolin - extremely limited suitable habitats occur along the riparian and open *Acacia karroo/Diospyros lycoides* woodland along the Klipgatspruit. These areas have been designated as highly sensitive and not proposed for development purposes. As the Pangolin is nocturnal activities in the reserve must be strictly managed at night. Suitable habitat exists surrounding then site for Ground Pangolins in the open and closed *Acacia* woodlands as well as limited patches of floodplain grassland along the klipgatspruit.

Current levels of human presence in the area (new residential developments, municipal dump, several vagrants, illegal hunting and poaching) will have resulted in the disappearance of the majority of larger mammals. Suitable habitat occurs in the rocky Acacia woodlands and rocky outcrops for smaller and certain large mammal species such as Cape Porcupine, Large-Spotted Genet, Slender Mongoose, Lesser Bushbaby. Rocky outcrops provide important habitat for rupicolous mammal species such as Eastern Rock-Elephants-Shrew and Smith's Red Rock Rabbit. As the majority of threatened mammal species are secretive nocturnal species activities at night must be strictly managed. The current closure of the reserve during the night results in minimal disturbances to the nocturnal mammal species such as Pangolin, Selous' Mongoose, African Wild Cat and Aardvark.

### **Birds**

Rich bird diversity occurs surrounding the site especially in the Gustav Klingbiel Nature Reserve where 216 bird species have been recorded. Secretarybirds have been recorded from the adjacent Gustav Klingbiel Nature Reserve, but no old nesting sites were recorded during the current survey. This may be due to increased human activities on and around the site. Limited foraging potential occurs in the degraded grasslands on the site. Suitable foraging areas occur to the east on the midlopes and crescents of the Arbeidskop as well as Vyekop.

Several Red Listed Bird Species have been recorded in the adjacent Gustav Klingbiel Nature Reserve including Secretary Birds (Near-Threatened), Blue Crane (Vulnerable), Denham's (Stanley) Bustard (Vulnerable), Whitebellied Korhaan

(Vulnerable) And Cape Griffon (Vulture) (Vulnerable), Blackwinged Lapwing (Plover) (Near-Threatened) and Half-Collared Kingfisher (Near-Threatened). The majority of these have been excluded due to limited habitat availability as well as high levels of human disturbances bordering the site including several new residential developments.

No rare or threatened bird species were observed during the brief field survey but certain rare or threatened bird species including Secretarybird may temporarily utilise the site for foraging and exploratory movements. The annual burning of the grasslands creates favourable habitat for Black-winged Lapwings/Plovers. The Klipgatspruit and artificially created dams provide favourable habitat for Half-Collared Kingfishers.

### **Amphibians**

No threatened frog species is likely to occur on the site. The Gustav Klingbiel Nature Reserve offers suitable habitat for several amphibian species especially in the seasonal wetland habitats and pools along the Klipgatspruit.

### **Reptiles**

Rich reptile diversity is expected in the Gustav Klingbiel Nature Reserve with over 50 reptile species recorded from the area.

No endangered reptile species were recorded during the brief field survey or are likely to occur on the site. Suitable habitat occurs in the *Acacia* woodland and rocky hills to the north of the proposed site for Southern African Python. Limited suitable habitat remains for the Swazi Rock Snake as well as Yellowbellied House Snake along the Klipgatspruit and grassland with rocky outcrops. The proposed development if restricted to the degraded grassland areas of the site should not negatively impact on the remaining African Rock Python, Swazi Rock Snake and Yellowbellied House Snake populations. No rock material must be removed from the site or used for construction activities but relocated in suitable habitat away from the development or alternatively used for landscaping purposes. As a precautionary measure a thorough search should be conducted in the development footprint; especially loosely embedded rock material and moribund termite mounds; and any reptile species recovered released in suitable habitat away from the development.

A sensitivity plan has been prepared which maps the areas of sensitivity and which the specialists have recommended should not be developed. Refer **Appendix D.03: Sensitivity Plan**

## **2.5.4 Invertebrates**

A specialist invertebrate investigation was undertaken of the conditions on the site, which is contained in **Appendix G.03: Invertebrate Study for Portion 55 and a Part of Portion 93 of the Farm Townlands of Lydenburg 431-JT**. A summary of the findings is set out below:

There are currently 13 species of invertebrates that are threatened, rare and of conservation concern in Mpumalanga province. These include seven species of butterfly and six Odonatan species. None of these species were encountered during the survey. This, however, does not imply that one will not encounter any of these species in the study area as they may have been missed by sampling due to multiple factors. Records indicate that two Red Data butterfly species, namely *Metisella meninx* and *Aloeides nubilis*, are known to within 50km of the site.

Localized populations of *Metisella meninx* commonly known as the Marsh Sylph butterfly, are found in vleis in many parts of Mpumalanga province. It frequents marshes at altitudes between 1600 and 1700m, usually in clean water. The species is also known to occur in North West province (Potchefstroom), Mpumalanga (Amsterdam, Bethal, Chrissiesmeer & Lydenburg), Northern KwaZulu-Natal (Newcastle & Vryheid), Northern Free State (Sasolburg) and through out southern and central Gauteng. Nevertheless, much of this species habitat has been destroyed by urban development. Its larval foodplant *Leersia hexandra* (Rice Grass) is easily recognizable due to the presence of white hairs at its nodes. *Metisella meninx* is the only invertebrate species of conservation concern known to occur in the Lydenburg vicinity. No specimens of this butterfly were observed nor was its food plant *Leersia hexandra* observed on the site.

*Aloeides nubilis*, commonly known as the Cloud Copper, is known only from two colonies in the Pilgrims Rest area. This species occurs exclusively in pristine grassland in the mist belt. No such habitat is present on or in the vicinity of the site.

Records indicate that two vulnerable Odonatans, namely *Pseudagrion newtoni* and *Aeshna ellioti usambarica*, are known to occur within 100km of the site.

*Pseudagrion newtoni* is a damselfly known from a single locality in the Pilgrim's Rest area. Although originally described in Kwazulu-Natal (Nqutu), it has not recently been observed in this area. This species requires fine long grasses and reeds at the margins of swift clear, upland rivers. No such habitat is present on or in the vicinity of the site.

*Aeshna ellioti usambarica* is a dragonfly that is relatively widespread in Africa. It is nevertheless only known from two localities in South Africa, namely Kaapsehoop and Mariepskop. It is known to occur in montane pools adjacent to natural forest. Interestingly, the construction of farm dams adjacent to natural forest appears to benefit the species. No natural forest occurs on or in the vicinity of the site and it is therefore unlikely that *Aeshna ellioti* will be located in this area.

A sensitivity plan has been prepared which maps the areas of sensitivity and which the specialists have recommended should not be developed. Refer **Appendix D.03: Sensitivity Plan**

## **2.5.5 Geotechnical Conditions**

A specialist geotechnical investigation was undertaken of the conditions on the application site, which is contained in **Appendix G.04: Geotechnical Study for Development of Gustav Klingbiel Nature Reserve**. A summary of the findings is set out below:

The area is underlain by the shale of the Silverton Formation, Pretoria Group, Transvaal Super Group. The shale has been intruded by diabase in sections of the site. The site is therefore, not underlain by dolomite of the Chuniespoort Group. And has therefore no potential for sinkhole or doline formations. The profile indicates areas underlain by diabase and areas underlain by shale. The conditions have a low to moderate permeability. The lower reworked/ residual diabase/ shale soils are expected to be moderately to highly plastic and so these soils would be unsuitable to use for construction.



The report makes recommendations for the nature of foundation treatment and excavations for each of the different zones.

#### **2.5.6 Social Issues**

The site, located within the Gustav Klingbiel Nature Reserve, is located on the eastern edge of the town of Lydenburg. It is a main urban centre, has an established economy and infrastructure and a large population. It is the centre of a strong mining industry in the region and has strength in the tourism, agriculture, manufacturing and forestry industries, with mining contributing nearly 30% to the economy.

The Thaba Chweu Municipal District has a population of  $\pm 135\ 000$ , comprising of approximately 43 000 households, whilst Lydenburg / Mashishing has a population of  $\pm 59\ 000$  comprising of approximately 16 000 households.

With the growth of the mining industry in the region (see 2.5.7) there has been an associated demand for residential accommodation in the town, being the closest established residential area to the mines. Linked to this is the demand for recreation and leisure facilities with associated accommodation. Market research by Urban Econ has demonstrated that the most significant growth in the population in the town has been in the 36 to 49 year age group, clearly associated with the economically active level of the population. The establishment of Sterkspruit Estate and the Heads is clearly in response to this growing demand.

The development of the project proposal, is seen as a positive move aligned with growth trends in the area. This will contribute in some measure to the increased residential and tourism population growth in the town.

#### **2.5.7 Economic Issues**

Lydenburg has an established economy and infrastructure and a large population. It is the centre of a strong mining industry in the region and has strength in the tourism, agriculture, manufacturing and forestry industries, with mining contributing nearly 30% to the local economy. Lydenburg contributes about 58% of the share of businesses in the Municipal area. The mining component is dominated by platinum group metals and chrome. There are approximately 13 mines in the Lydenburg region, which include Xstrata, Anglo Platinum, Aquarius Platinum, African Rainbow Minerals, Northam Platinum and Wesizwe.

The economic crisis saw 48 proposed mine shafts in the area put on hold, however 12 new shafts currently proposed and a new mine (Booyssendal) is also currently being developed. This would be the biggest mine in the area, with the development of second phase aimed to be completed by 2018, the first phase starting production in 2011.

The implications of the above, whilst temporarily affected by economic conditions, does not negate from the fact that Lydenburg has a strong economy dominated by mining and manufacturing, which provides further strength for diversification of the tertiary sector.

The trends in this town are a clear indication of the growth in the area, which has associated linkages to further business growth and tourism growth, which is associated with the need and availability of tourism facilities and accommodation.

Market research undertaken by Urban Econ in February 2011 indicated that Lydenburg has only 10 accommodation facilities, with an average weekday occupancy of 83% of which 83.5% is business related. It was also ascertained that 30% of tourism to the Mpumalanga province was business related and 5.8% is local/ domestic tourism business. This has been translated into 59 920 business bednights in Lydenburg.

These figures provide a clear picture of the shortage of accommodation (either business or tourism) and associated leisure facilities in and around the town of Lydenburg.

## 2.5.8 Cultural and Heritage

A specialist heritage assessment investigation was undertaken of the site, which is contained in **Appendix G.05: Heritage Impact Assessment for Gustav Klingbiel Project**. A summary of the findings is set out below:

The Lydenburg area is well known for stonewalled settlements dating back to the Later Iron Age. The most common belong to the Badfontein type. This type is characterised by a cattle track that leads through the outer wall of the settlement and then through a central enclosure to a series of stock kraals that in turn are attached to the left and right edge of the central enclosure. Stone Terraces often lie between the settlements, marking agricultural fields. The Badfontein type is traditionally associated with BaKoni people, who were originally Nguni speakers 'Sotho-ised' by people such as BaPedi.

The Lydenburg district is also of interest to archaeologists because of the famous 'Lydenburg Heads' dating to the Early Iron Age, and a specific ceramic style named after the Reserve.

The project area is divided by the dirt road leading from the museum down to the river. On the west side, tall grass covers the remnants of stone walling (**Site 1**). This site was noted by an earlier investigation as of *low significance* because not enough remains to map.

The remains of three mud brick houses stand next to the western boundary (**Site 2**). This house complex appears on the Lydenburg map, and farm labourers probably lived here until the establishment of the Reserve. It has *low significance*.

On the east side three copse of trees grow out of separate stonewalled settlements (**Site 3, Site 4, Site 5**). They all belong to the Badfontein type. Portions of each are well preserved and enough remains to map.

One of the purposes of the Reserve is to protect heritage resources as well as wildlife. Consequently, the importance of sites inside is greater than it would be for the same resource outside. For this extra reason **Sites 3-5** have *high significance*.

There may well be more walling in between the copses, but tall grass obscures the ground. There are no sites near the museum inside the project area.

The report recommends that if the hotel is built near the Museum as planned, mitigation is not required. If on the other hand, development extends further north and **Sites 3-5** are endangered, mitigation measures will be required. At the least, the endangered ruins must be mapped. In terms of research, there is a question

whether the houses were the Nguni or Sotho-Tswana type. Therefore a house area needs to be excavated in each site.

Furthermore, if development extends north, the area in between **Site 3-5** needs to be re-examined in the winter when the grass is low.

A sensitivity plan has been prepared which maps the areas of sensitivity and which the specialists have recommended should not be developed. Refer **Appendix D.03: Sensitivity Plan**

### 3. LEGISLATIVE FRAMEWORK

#### 3.1. Legislation

Title of legislation, policy or guideline:	Administering authority:	Promulgated on Date:
National Environmental Management Act No. 107 of 1998 (as amended)	National & Provincial	27 Nov 1998
Government Notice No. R543 of 2010 EIA Regulations	National & Provincial	2010
Government Notice No. R544 of 2010 Listing Notice 1	National & Provincial	2010
Government Notice No. R546 of 2010 Listing Notice 3	National & Provincial	2010
Constitution of the Republic of South Africa (108 of 1996)	National & Provincial	1996
National Water Act (36 of 1998)	National & Provincial	1998
Mpumalanga Nature Conservation Act (10 of 1998)	Provincial	1998
Conservation of Agricultural Resources Act (43 of 1983)	National & Provincial	1983
National Environmental Management: Biodiversity Act (10 of 2004)	National & Provincial	2004
National Environmental Management: Protected Areas Act (57 of 2003)	National & Provincial	2003
National Environmental Management: Protected Areas Amendment Act	National & Provincial	2004
Environmental Conservation Act (73 of 1989)	National & Provincial	1989
National Roads Act	National & Provincial	1998
Advertising on Roads and Ribbon Development Act (21 of 1940)	National & Provincial	1940
National Heritage Resources Act (25 of 1999)	National & Provincial	1999
Occupational Health and Safety Act (85 of 1993)	National & Provincial	1993
Promotion of Access to Information Act (2 of 2000)	National & Provincial	2000
Local Government Municipal Structures Act (117 of 1998)	National & Provincial	1998
National Environmental Management: Air Quality Act (39 of 2004)	National & Provincial	2004

#### 3.2. Policies & Guidelines

DRAFT EIA Regulations Implementation Guideline, 2010  
 DEAT Guideline 4: Public Participation (2006)  
 DEAT Guideline 5: Assessment of Alternatives and Impacts

### 4. PUBLIC PARTICIPATION PROCESS

#### 4.1. Approach

The public participation process (PPP) is a vital component of the Environmental process and also, therefore, critical to the success of the project. The purpose of the PPP is to ensure all the views and concerns of interested and affected parties (I&AP's) are identified, recorded and their addressed during the process. The PPP is of further importance, as issues are raised by I&AP's that have local and specialist knowledge of the area and of the site. The Public Participation Process followed is set out below

## 4.2. Identification of Stakeholders

Stakeholders were identified including relevant government organisations, conservation bodies, NGO groups, local business, etc. A list of the I&AP's forming the initial database, is enclosed in **Appendix E.02.1: List of Identified of I&AP's**

## 4.3. Notification to Interested and Affected Parties

The following public participation process was conducted in terms of Regulation 21 (2) (a)

- A notice board was erected on the boundary of the site **Appendix E.01: Proof of Site Notice**
- Notices were posted to all identified I&AP's listed in **Appendix E.02.1: Written Notices to I&AP's**. A copy of the letters distributed is contained in **Appendix E.02: Written Notices to I&AP's**.
- A notice was published in a local newspaper, namely the Steelburg, proof is attached as **Appendix E.03: Publication of a Notice in Newspaper**
- A meeting was held with the Nature Reserve Advisory Committee, copies of the minutes which are contained in **Appendix E.05: Minutes of a Meeting**
- Comments made by the parties registering, are contained in **Appendix E.06: Comments and Responses Report**

## 4.4. Registered Interested and Affected Parties

A register of all I&AP's was compiled, which is contained in **Appendix E.09: Register of Interested Parties**. All registered parties are to be notified of the availability of the Draft Basic Assessment Report, Final BAR and the Departments decision and appeal processes.

## 4.5. Comments from I&AP's

- Comments received from I&AP on the application during advertising are attached as **Appendix E.10: Comments from I&AP on Application**
- Comments received from I&AP on circulation of the Draft Basic Assessment Report will be included in the Final BAR
- A summary of issues raised and response by the EAP has been attached as **Appendix E.06: Comments and Responses Report**

## 4.6. Communications with I&AP's

Communications with I&AP's which may include records of telephonic discussions, copies of e-mail communication and written notices to registered I&AP's advising of the circulation of the BAR and any other relevant communications between the EAP and I&AP's. The aforementioned is attached as **Appendix E.04: Communications with I&AP's**. Comments have been included from the circulation of both the first draft and second draft Basic Assessment Reports, as there was a considerable down scaling of the development after the first draft was circulated.

This report serves as the final Basic Assessment and will be circulated again so I&AP can note that their comments have been addressed in **Appendix E.06: Comments and Responses Report**

## 5. IMPACT ASSESSMENT

### 5.1. Assessment Methodology and Criteria

The criteria for the description and assessment of the impacts have been drawn and adapted from the Guidelines to ECA (Act 73 of 1987) EIA Regulations and according to a synthesis of criteria required by the Integrated Environmental Management Procedure. (DEA Guideline Document) Although the ECA Regulations have been repealed, the Guideline Document still provides good guidance for conducting EIA's.

#### **Nature of Impact**

This is an appraisal of the type of effect the proposed activity would have on the affected environmental component. Its description should include what is being affected, and how.

#### **EXTENT**

The physical and spatial size of the impact. This is classified as:

##### ***Footprint***

The impacted area extends only as far as the activity, such as the footprint within the total site area.

##### ***Site***

The impact could affect the whole, or a measurable portion of the site

##### ***Regional***

The impact could affect the area including the neighbouring farms the transport routes and the adjoining towns.

##### ***National***

The impact could have an effect that expands throughout the country

##### ***International***

Where the impact has international consequences that extend beyond the boundaries of the country.

#### **DURATION**

The lifetime of the impact; this is measured in the context of the life-time of the proposed base.

##### ***Short term***

The impact will either disappear with mitigation or will be mitigated through natural process in a span shorter than any of the phases.

##### ***Short to Medium term***

This impact will be relevant through to the end of the construction phase

##### ***Medium term***

The impact will last up to the end of the development phases, where after it will be entirely negated.

##### ***Long term***

The impact will continue or last for the entire operational life of the development, but will be mitigated by direct human action or by natural processes thereafter.

##### ***Permanent***

The only class of impact which will be non-transitory. Mitigation either by man or natural process will not occur in such a way or in such a time span that the impact can be considered transient.

#### **INTENSITY**

Is the impact destructive, or benign? Does it destroy the impacted environment, alter it's functioning, or slightly alter it. These are rated as:

**Low**

The impact alters the affected environment in such a way that the natural processes or functions are not affected.

**Medium**

The affected environment is altered, but natural, cultural and social functions and processes continue, albeit in a modified way.

**High**

Natural, cultural and social functions or processes of the affected environment are altered to the extent where it will temporarily or permanently cease.

This will be a relative evaluation within the context of all the activities and the other impacts within the framework of the project.

**PROBABILITY**

This describes the likelihood of the impacts actually occurring. The impact may occur for any length of time during the life cycle of the activity, and not at any given time. The classes are rated as follows:

**Probable**

The possibility of the impact occurring is little to none, due either to the circumstances, design or experience. The chance of this impact occurring is defined as 0% to 5%

**Possible**

The possibility of the impact to materialise is very low, due either to the circumstances, design or experience. The chances of this impact occurring is defined as 25%

**Likely**

There is a possibility that the impact will occur to the extent that provisions must therefore be made. The chances of this impact occurring is defined as 50%

**Highly Likely**

It is most likely that the impacts will occur at some stage of the development. Plans and mitigations must be drawn up before implementing the activity. The chances of this impact occurring is defined as 75%

**Definite**

The impact will take place regardless of any prevention plans, mitigation measures or contingency plans to contain the effect of the impact. The chances of this impact occurring is defined as 100%

**SIGNIFICANCE**

Significance is determined through a synthesis of impact characteristics. Significance is an indication of the importance of the impact in terms of both physical extent and time scale, and therefore indicates the level of mitigation required.

The classes are rated as follows:

**No significance**

the impact does not influence the proposed development and/or environment in any way;

**Low significance**

the impacts will have a minor influence on the proposed development and/or the environment. These impacts do not require modification of the project design or alternatives modification.

**Medium significance**

the impacts will have a moderate influence on the proposed development and/or the environment. The impacts can be ameliorated by modification in the project design or implementation of effective mitigation measures.

**High significance**

the impacts will have a major influence on the proposed development and/or the environment. These impacts could have the "No-Go" implication on portions of the proposed development regardless of any mitigation measures that could be implemented.

Impacts will be determined in accordance with table summarizing the above, providing also a summary of practical mitigation measures, which will be contained in an Environmental Management Plan, refer **Appendix H: Environmental Management Plan**

### Identification of Mitigation Measures

An assessment will be made on the nature of and to what extent mitigation measures can be used to reduce or alleviate negative impacts, based on the reduction of the impact at source, the management of the impact through monitoring and control, and the involvement of the I&APs in consideration of mitigating measures, where appropriate.

## 5.2. Impact Assessment

### 5.2.1 Impact on Physical Nature of the Land - Impact Statement

The development will have an impact in terms of changing and transforming the physical land form, its character, visual nature and function of the land, by changing its image, loss of openness, use and appearance.

#### Impact Table

	<b>Impact Changed physical nature of the land</b>					
<b>Development Phase</b>	<b>Nature</b>	<b>Extent</b>	<b>Duration</b>	<b>Intensity</b>	<b>Probability</b>	<b>Significance</b>
Construction	Increased use of area	Local	medium	Low	Probable	Medium
Operation	Increased use of area	Local	Long	Low	Probable	Medium

#### Description of the Impact

##### **Construction phase**

During construction, it will be necessary to clear and level the site for where the structures and facilities will be placed. It will also be necessary to stockpile building materials. The major impacts resulting from these activities are potential soil erosion and increased water runoff. There will be impacts also from increased construction traffic, contractors and workers. As the larger area of the site mostly contains degraded grasslands and has poor ecological conditions, significance of the physical changes are considered to only be of a medium significance, particularly as the footprint is to be small in area and limited to specific locations.

##### **Operational Phase**

During the operational phase of the activity, there will remain a changed visual, physical and functional use of land, increased hard surfaces, loss of open land, increased traffic and human presence in the area and a general increased physical footprint. The larger area of the site will remain undeveloped and natural, albeit that it mostly contains degraded grasslands, and the operational activities will be restricted to the specified development areas (hotel, lodges and roads) and, therefore, the operational phase is also considered to be of a medium significance.

## Significance

The construction and operation of the development will have a probable, short term, but medium significance on the site and in the immediate surrounding area during construction and the long term during the operational phases, in terms of changed visual, physical and functional use of the land and from increased hard surfaces, loss of open land, increased traffic and human presence in the area. This is primarily due to the fact that the areas to be developed are generally degraded, have lost their value as significant habitat areas and are subject to the edge effects of adjoining developments. The significance need not be rated any higher, as only  $\pm 8\%$  of the entire 26 hectare site will be transformed, with the remainder of the untransformed land remaining open, natural and indigenous. Activities are, therefore, to be restricted to the built and transformed areas.

## Mitigation Measures

The physical size and footprint of the application proposals are considered to be relatively small in relation to the wider Gustav Klingbiel Nature Reserve land area, (ie only  $\pm 2-3$  hectares in total) therefore adding only marginally to the current footprint in the reserve. This will, however, result in a changed physical appearance and functioning of this part of the reserve. Mitigation of the proposals are not considered to be significant in view of the relatively small scale of the footprint and the nature of the ecological conditions. Mitigation measures to prevent and reduce any anticipated impacts, however, will be dealt with under the relevant sections that follow.

Practical mitigation measures are set out in **Appendix H: Environmental Management Plan**

### 5.2.2 Impact on Ecological Processes, Habitat and Biodiversity – Impact Statement

The development will have a potential impact on loss of natural habitat, the floral ecological diversity on the site and of mammal and invertebrate populations.

#### Impact Table

	Impact Loss of ecological diversity on site					
Development Phase	Nature	Extent	Duration	Intensity	Probability	Significance
Construction	Loss of ecological attributes	Local	medium	Low	Probable	Low
Operation	Loss of ecological attributes	Local	Long	Low	Probable	Low

#### Description of the Impact

##### **Construction phase**

The construction of the development will result in a probable, short term, but a low significance on the site and in the immediate surrounding area during the construction phase, in terms of clearing the land and loss of natural habitat and living species. This is due to the fact that these parts of the site are already largely degraded, there are poor ecological conditions prevailing and no sensitive habitat. Activities are to be restricted to the built and transformed areas where the development footprint will occur. The sensitive area within the riparian zone, however, will not be utilised for development.



### Operational Phase

During the operational phase of the activity, there will remain a loss of habitat with a changed functional use of land with increased hard surfaces, loss of open land, increased traffic and human presence in the area and a general increased physical footprint. However, activities will be restricted to the built and transformed areas where the development footprint will occur

### Significance

The proposed use of parts of the site and the expected  $\pm 2-3$  ha footprint of the activities will result in a small and negligible area being transformed. The various specialist ecological investigations note that the larger area of the site, outside the riparian zone area, is already largely transformed and degraded due to human activities, grazing and previous cultivation impacts. The larger area of the site generally has a low conservation value and, therefore, little remaining of any conservation value. Significance is, therefore, low.

### Mitigation Measures

Mitigation would be to limit building and operational activities to non sensitive areas, to limit the footprint to the least area required, further to demarcate and protect the sensitive areas and to ensure that landscaping is to include natural species, in an endeavour to improve and reinstate natural habitat. Any activities in the riverine area in the northern extent of the site should not include any permanent structures or roads and should only be used for low impact uses such as picnicking, walking and bird watching. There should be no transformation of the land in this area

Practical mitigation measures are set out in **Appendix H: Environmental Management Plan**

#### 5.2.3 Impact of Water Runoff - Impact Statement

The development will have a potential impact on the biological conditions of the area in terms of increased water runoff and potential increased surface and ground water.

#### Impact Table

Development Phase	Impact Increased runoff, erosion and water pollution					
	Nature	Extent	Duration	Intensity	Probability	Significance
Construction	Erosion & pollution of water	Local	medium	Low	Probable	Low
Operation	Erosion & pollution of water	Local	Long	Low	Probable	Low

#### Description of the Impact

##### Construction phase

During construction, with the clearing of the site, there will be the potential for increased stormwater runoff from the transformed land and the potential for water pollution

### Operational Phase

During the operational phase of the activity, there could be increased stormwater runoff and potential water pollution and impacts on the immediate adjoining areas.

### Significance

The significance of the impact is expected to be a low, this being due to the relatively small scale of the envisaged developed footprint and hard surfaces, the small relatively minor removal of vegetation in comparison to the larger site area

### Mitigation Measures

Certain attenuation would be required in and around the larger structures, such as the hotel and museum, ensuring the prevention of erosion during both the construction and operational phases. Due to the low level of transformation, water runoff should be allowed to move naturally across the landscape, so long as potential concentrations of flows are mitigated and diffused to prevent erosion. The use of natural landscaping should be implemented to assist with water distribution and attenuation.

Practical mitigation measures are set out in **Appendix H: Environmental Management Plan**.

#### 5.2.4 Cultural and Heritage – Impact Statement

The development has the potential to result in the loss of cultural, heritage and historic features

#### Impact Table

Development Phase	Impact Impact on cultural, historic & archaeological features					
	Nature	Extent	Duration	Intensity	Probability	Significance
Construction	Loss of heritage	Local	medium	Low	Probable	Low
Operation	Loss of heritage	Local	Long	Low	Probable	Low

#### Description of the Impact

##### **Construction phase**

During construction, with the clearing of the site, there is the potential for loss of cultural or heritage features. As the envisaged development footprints are not in close proximity to the position of the identified archaeological sites, this has low significance.

##### **Operational Phase**

As the envisaged development footprints are not in close proximity to the position of any identified cultural / archaeological sites, this has low significance during the operational period.

### Significance

The significance of the impact is expected to be low, as there are no sites in close proximity to the proposed developments. However, the sites falling outside the site boundary should be adequately protected to prevent tourists from vandalising or damaging such features

### **Mitigation Measures**

The sites should be protected so that they are not damaged or vandalised.

Practical mitigation measures are set out in **Appendix G: Environmental Management Plan**

#### **5.2.5 Impact of Increased Traffic – Impact Statement**

The development could have an impact on the capacities and functioning of roads in the area, arising from increased traffic volumes.

##### **Impact Table**

	<b>Impact Increase demand on roads from traffic</b>					
<b>Development Phase</b>	<b>Nature</b>	<b>Extent</b>	<b>Duration</b>	<b>Intensity</b>	<b>Probability</b>	<b>Significance</b>
Construction	Road capacities	Local	Medium	Low	Probable	Low
Operation	Road capacities	Local	Long	Low	Probable	Low

##### **Description of the Impact**

#### **Construction phase**

The construction of the development will have probable, short term and but low significance on the existing road infrastructure and traffic volumes in the area. As access to the site will be through the existing access for the museum, the impacts on the site will be low. As the development will be phased over a period of time, construction volumes will be low, but extended over time

#### **Operational Phase**

During the operational phase of the activity, vehicles will have access to the hotel and museum and be limited to official roads within the site. Impacts on the wider area of the site, therefore, will be low. The traffic consultants have calculated expected volumes and confirmed that these can be accommodated within the existing roads and intersections without the need to improve or upgrade any external roads.

#### **Significance**

The amount of traffic to be generated during the construction and long term operation period has been determined to be of low significance due to envisaged restrictions and controls on circulation on the site. Volumes will not be such that any road or intersection upgrading is required in the area

### **Mitigation Measures**

Restrictions and controls on circulation, access and parking on the site will be required to limit and mitigate impacts to the wider area of the site.

Practical mitigation measures are set out in **Appendix G: Environmental Management Plan**

### 5.2.6 Visual Issues – Impact Statement

The development could have implications on the visual image of the area, altering the openness of the site and expanding the developed footprint

#### Impact Table

Development Phase	Impact Changed visual impact and sense of place					
	Nature	Extent	Duration	Intensity	Probability	Significance
Construction	Changed visual image	Local	medium	Low	Probable	Medium
Operation	Changed visual image	Local	Long	Low	Probable	Low

#### Description of the Impact

##### **Construction phase**

The construction of the development is considered to have a medium level of significance on the changed visual impact of the site, as a result of construction activity. The alteration of the land form, removal of vegetation and the presence of construction activities, people and vehicles will be visible mostly from adjoining properties, altering the ambience and openness of the area.

##### **Operational Phase**

During the operational phase of the development, the visual impact of the structures will have a medium level of significance as the hotel will be located to the east of the museum and therefore, not impact on the larger area of the reserve. The planned self catering lodges will have a more significant impact, as they are to be located within the heart of the site, although, as they are envisaged as low impact, single storey, rustic and environmentally friendly, their impact will generally be of a medium level of significance.

##### **Significance**

The proposed structures on the site are anticipated to have a relatively small footprint and will be of a low height and be constructed of materials sensitive to the area. As such, the activity will have a low significance in the long term.

##### **Mitigation Measures**

The mitigation of visual impact of structures can be addressed through the use of appropriate rustic and natural materials and finishes, control of lighting, colours, and design aspects, to ensure the structures are harmonious with and sympathetic to the surrounding environment.

Practical mitigation measures are set out in **Appendix G: Environmental Management Plan**

### 5.2.7 Impact on Social Conditions of the Area – Impact Statement

The development will have implications to the social conditions of the area, affecting the livelihoods of both existing and future communities, residents and employees.

#### Impact Table

	<b>Impact Impact on the Social conditions of the communities</b>					
<b>Development Phase</b>	<b>Nature</b>	<b>Extent</b>	<b>Duration</b>	<b>Intensity</b>	<b>Probability</b>	<b>Significance</b>
Construction	Affect community amenity	Local	medium	medium	Probable	Medium
Operation	Affect community amenity	Local	Long	medium	Probable	High (positive)

#### Description of the Impact

##### **Construction phase**

The construction of the development could result in impacts on the local surrounding community, residents and visitors to the reserve from nuisance, noise, disturbance and construction traffic during the construction period. There are, however, no residents immediately adjoining or within the development footprint areas and, therefore, significance would be of a medium level. There may be inconvenience to visitors during the upgrading of the museum, as this may be temporarily closed.

##### **Operational Phase**

The operational phase of the development will result in more positive and tangible benefits and impacts on the social conditions of the area, as it will contribute to increased tourism opportunities in the Reserve and the area generally, both for local residents and for visitors. This will have a probable, long term, but positive significance.

##### **Significance**

The activity has medium significance during the construction period, due to the associations of building operations. However, during the operational period, positive implications and significance is expected, as the additional facilities in the reserve will contribute to expanded facilities for leisure, recreation and tourism for not only visitors to the area, but to the local population

##### **Mitigation Measures**

The mitigation of nuisance factors associated with the construction period must be addressed in terms of noise control, construction traffic, nuisance, etc, to reduce impacts to adjoining residents and communities.

Practical mitigation measures are set out in **Appendix G: Environmental Management Plan**

### 5.2.8 Impact on Economic Conditions of the Area – Impact Statement

The development will have implications to the economic conditions of the area, affecting the livelihoods of both existing and future communities and employees.

## Impact Table

	Impact Impact on the Economic conditions of the communities					
Development Phase	Nature	Extent	Duration	Intensity	Probability	Significance
Construction	Affect community amenity	Local	medium	medium	Probable	High (positive)
Operation	Affect community amenity	Local	Long	medium	Probable	High (positive)

### Description of the Impact

#### **Construction phase**

The construction of the development will result in impact on the economic conditions of area, as it has the potential to provide employment during the construction phase with associated spinoff benefits to local businesses in Lydenburg. This will have a probable, short term, but positive significance. The development will also result in a positive investment in this area in terms of contributing to the economic viability of the Nature Reserve, its long term management and sustainability.

#### **Operational Phase**

The operational phase of the development will result in impact on the economic conditions of the area, as it will contribute to the tourism opportunities of the Reserve and the area generally, providing not only increased income into the area, but creating a significant economic investment in the area. There are also benefits in terms of new and additional employment opportunities with this new tourism operation in both the hotel, lodges and management of the reserve.

The associated economic benefits of the project will be the stabilization of the economic conditions of the reserve, enhancing its sustainability, management and operation. There are potentially wider economic benefits to the town and local residents and communities in terms of increased spending from visitors to the reserve, the hotel and its associated facilities. This will have a probable, long term, but positive significance.

#### **Significance**

The activity has positive economic significance generally, associated with the creation of a whole new “business” operation. These are associated with the creation of employment in the area, with associated benefits to the families of the employees, increased trade for local businesses, benefits to the economic and ecological sustainability of the Reserve. The development also has positive significance in terms of a significant capital injection into the area.

#### **Mitigation Measures**

The mitigation of positive economic benefits are not envisaged

Practical mitigation measures are set out in **Appendix G: Environmental Management Plan**

### 5.2.9 Impact of Increased Pollution – Impact Statement

The development could have an impact on an increase in pollution, in particular, noise pollution, light pollution, water pollution, visual pollution and nuisance.

#### Impact Table

	Impact Increase in Pollution in the Area					
Development Phase	Nature	Extent	Duration	Intensity	Probability	Significance
Construction	Various forms of pollution	Local	medium	medium	Probable	medium
Operation	Various forms of pollution	Local	Long	medium	Probable	Medium

#### Description of the Impact

##### **Construction phase**

The construction activities of the development will have probable, short term, but a medium significance on the site and in the immediate surrounding areas from various pollution sources during the construction phases. Impacts from dust, noise, waste, emissions and nuisance can be expected during this period.

##### **Operational Phase**

The operation of the development will have probable, long term, but a low significance on the site and in the immediate surrounding area from various pollution sources during the operational phase. Major pollution sources are expected to be predominantly from noise emitted from vehicles and people visiting and staying the reserve. Waste will be generated by the development, to be managed and removed by the operator, whilst all other forms of pollution will be managed through the overall environmental management of the reserve

##### **Significance**

The implications of various forms of pollution during the construction period will have medium significance, due to the need for earthworks, etc. However, these are temporary and will cease once all construction is completed. Pollution during the operational phases that can be anticipated would be those associated with activities related to any tourism operation. With appropriate controls and mitigation measures in place, these impacts will be managed and would have negligible impact on the site and surrounding area

##### **Mitigation Measures**

The mitigation of pollution generation can be addressed through the use of appropriate environmental and ecological management tools, to be implemented by the operator during both the construction and operational periods

Practical mitigation measures are set out in **Appendix G: Environmental Management Plan**

### 5.2.10 No Go Alternative – Impact Assessment

It is required in terms of the National Environmental Management Act that the alternative of not proceeding with any project implementation be considered and the impacts thereof, be assessed.

**Physical**

A No-go alternative would result in the identified parts of the site remaining untransformed, with no additional structures established in the reserve. There would be no upgrading of the museum, which forms part of the Council's contract with the application. The status quo would remain.

**Ecological**

A No-go alternative would result in the identified parts of the site remaining vacant, undeveloped and untransformed, retaining their current ecological status. It has been demonstrated that the developable areas are considerably degraded and disturbed and have a low ecological value. This status of the habitat would, therefore, remain. Whilst it is possible to rehabilitate the habitat, it is known that there are financial constraints facing the Council for this investment and therefore, rehabilitation of these disturbed areas would seem unlikely

**Social**

A No-go alternative would result in no additional tourism facilities to either visitors to the area or the local residents. There would be no additional accommodation, leisure or recreation activities available in the Reserve. There would, however, be no change in the visual image within this sector of the reserve.

**Economic**

A No-go alternative would result in no opportunity to create a significant private investment into the Reserve and the area. This would mean no additional injection of finances or funding into the ongoing maintenance and management of the Reserve, for upkeep of resources, road maintenance, removal of alien vegetation, management of erosion, etc. Such lack of capital investment would also prevent any associated spinoff benefits to local business operations. Furthermore, it would prevent the opportunity of providing a significant amount of employment during both the construction and operational periods.

Clearly a no-go option for the project would have significant negative implications on economic conditions in the area and the future sustainability of the nature reserve

**Cultural and Heritage**

No sites of archaeological or cultural heritage were identified within the application site and, therefore, a no-go alternative would have no implications on this element.

**Pollution, Noise, Nuisance, Disturbance**

A No-go alternative would mean no additional noise, nuisance, disturbance or any potential for increases in any form of pollution, both during the construction and operational periods.



## 6. Environmental Impact Summary

Identified Impact	Phase	Significance Rating (SR)	Significance Following Mitigation (SFM)
Physical alteration of land, installing services	Construction	Medium	Medium
	Operational	Medium	Medium
Loss of ecological diversity, fauna, flora	Construction	Low	Low
	Operational	low	Low
Water Pollution / erosion	Construction	Low	Low
	Operational	Low	Low
Visual Impacts	Construction	medium	Low
	Operational	Medium	Low
Heritage	Construction	Low	Low
	Operational	Low	Low
Visual	Construction	Medium	Medium
	Operational	Medium	Low
Social impact on residents	Construction	Medium	Medium
	Operational	High positive	High positive
Private investment	Construction	High positive	High positive
	Operational	High positive	High positive
Employment opportunities	Construction	High positive	High positive
	Operational	High positive	High positive
Tourism amenities	Operational	High positive	High positive
Sustainability of the Reserve	Operation	High positive	High positive

## 7. Impacts that may result from decommissioning the activity

Potential impacts:	Significance rating of impacts:	Proposed mitigation:	Significance rating of impacts after mitigation:
Physical	Low	This project has an extended lifespan period, and it is determined that decommissioning of the project will never happen. Due to this, no possible mitigation can at this stage be tabled, due to many environmental changes that will take place over time, which will subsequently render any mitigation discussed, void.	Low
Bio-physical	Low	This project has an extended lifespan period, and it is determined that decommissioning of the project will never happen. Due to this, no possible mitigation can at this stage be tabled, due to many environmental changes that will take place over time, which will subsequently render any mitigation discussed, void.	Low
Social	Low	This project has an extended lifespan period, and it is determined that decommissioning of the project will never happen. Due to this, no possible mitigation can at this stage be tabled, due to many environmental changes that will take place over time, which will subsequently render any mitigation discussed, void.	Low
Economic	Low	This project has an extended lifespan period, and it is determined that decommissioning of the project will never happen. Due to this, no possible mitigation can at this stage be tabled, due to many environmental changes that will take place over time, which will subsequently render any mitigation discussed, void.	Low

8. A description of any assumptions, uncertainties and gaps in knowledge;

The EAP is of the opinion there are no uncertainties or gaps in knowledge. Certain assumptions are addressed in the body of the report

9. **Cumulative Impacts**

With any development, changes in and to the existing environment must be expected. The project proposals are for development within a Municipal Nature Reserve, although such development is entirely tourism related, with the provision of additional accommodation infrastructure, associated services and the condition the applicant upgrade the Lydenburg Museum. The EAP is aware there are various other conditions linked to the applicant's contract with the Thaba Chweu Municipality, which include aspects of funding of maintenance in the Reserve, etc.

As such, the cumulative impacts of the project are associated with marginally increasing the development footprint in the reserve, but it is linked with various trade-offs, benefits and economic elements, which will contribute to the long term ecological sustainability of the Gustav Klingbiel Nature Reserve.

Further cumulative impacts include the loss of habitat, but it has been determined this is habitat already disturbed and degraded and will not significantly impact on the wider ecology of the reserve.

Other cumulative impacts include the positive impact to the local community and residents who will experience both social and economic benefits in terms of increased leisure activities and accommodation in the reserve, increased spending in the town, new and additional employment opportunities.

10. **Overall Impact Summary**

**Alternatives**

The project, ie the establishment of accommodation facilities in the south western corner of the Gustav Klingbiel Nature Reserve adjoining the Museum, was determined to have the least impacts in comparison to the Alternative sites investigated in the heart of the Reserve. The proposed location has been determined to already be impacted and the location on the edge of the Reserve will ensure avoiding negative impacts in the highly sensitive interior of the Reserve.

**Environmental Impact**

The impact of the project will have a low ecological impact as the specialists have determined that the site generally has no important or conservation worthy habitat, apart from the riverine area, which is to be preserved.

**Social / Community Impacts**

It has been determined that the project will have highly positive significance and impacts from a social perspective, with the provision of additional accommodation infrastructure, associated services and the upgrading of the Lydenburg Museum.

**Economic Impacts**

It has been determined that the project will have highly positive significance and impacts from an economic perspective, from the significant private capital investment into the Reserve and funding for ongoing ecological maintenance to ensure the sustainability of the

Reserve. Other economic benefits include positive impact to the local community and residents who will experience both benefits in terms of increased leisure activities and accommodation in the reserve, increased spending in the town, new and additional employment opportunities.

### **No Go Alternative**

A no-go alternative has revealed that no further development or improvements would occur in the reserve, but this would then result in no additional tourism facilities.

Additionally, there will be no opportunities to create a significant private investment into the Reserve and the area. This would mean no additional injection of finances or funding into the ongoing maintenance and management of the Reserve, for upkeep of resources, road maintenance, removal of alien vegetation, management of erosion, etc. Such lack of capital investment would also prevent any associated spinoff benefits to local business operations. Furthermore, it would prevent the opportunity of providing a significant amount of employment during both the construction and operational periods.

As such, the no go alternative, whilst it prevents any transformation in the reserve, has the potential to limit and restrict its long term sustainability, basic on economic need.

### **Conclusion**

In conclusion, the project proposals provide more positive than negative impacts. It is therefore the opinion of the EAP that this will be a significant improvement to the Reserve and that the negative impacts can be mitigated sufficiently to ensure minimal negative effects to the environment.

## **11. EAP Opinion**

It is the opinion of the EAP that this development proposal will have a positive impact to the community and visitors to the town and will significantly contribute to the ecological sustainability of the Gustav Klingbiel Nature Reserve. Furthermore, the EAP is of the opinion that the negative impacts can be mitigated sufficiently to acceptable levels to minimise negative effects to the environment and to maximise positive implications socially and economically.

It is therefore the opinion of the EAP that proposed development be approved within the conditions and recommendations of this report.