PROPOSED TOWNSHIP ESTABLISHMENT: LEEUWFONTEIN EXTENSION 20 (SITUATED ON A PART OF PORTION 55 (A PORTION OF PORTION 1) OF THE FARM PIENAARSPORT 339 JR)

ENVIRONMENTAL SCREENING REPORT

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PROJECT DETAILS

TITLE: Environmental Screening Report: Proposed Township Establishment: Leeuwfontein Extension 20 (Situated on A Part of Portion 55 (A Portion of Portion 1) of The Farm Pienaarspoort 339 JR)

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CLIENT: Hunter Theron Inc

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SUBMISSION DATE: February 2013

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Project Leader: Environmental Assessment Practitioner
DETAILS AND EXPERTISE OF THE ENVIRONMENTAL ASSESSMENT PRACTITIONER (EAP)

The requirement for independence of the Environmental Assessment Practitioner (EAP) is aimed at reducing the potential for bias in the environmental process. Neither Delron Consulting nor any of its sub-consultants are subsidiaries of Hunter Theron Inc. / Infrasors Holdings Limited nor is Hunter Theron Inc./ Infrasors Holdings Limited a subsidiary to Delron. Furthermore, none of the parties have any interests in secondary or downstream developments that may arise out of the authorisation of the proposed project.

The Project Director, Mr. P De Lange is appropriately qualified and/or registered with the relevant professional bodies. Mr. P De Lange (BL (UP) Pr LArch SA) is a Registered Professional Landscape Architect with the South African Council for the Landscape Architectural Profession (SACLAP): Member Number 20124. Delron is bound by the codes of conduct for SACLAP and EAPSA.

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• IAIAsa: (International Association for Impact Assessments) South Africa | 20 years |
| Miss MR la Grange     | BSc Ecology; BSc (Hons) Plant Ecology | | 1 year |

P De Lange BL (UP) (Pr. LArch SA), director and founder of Delron Consulting, is a Professional Registered Landscape Architect, who consulted successfully for 20 years as a landscape architect and environmental assessment practitioner.

Experience:


Project experience includes the establishment of various housing typologies, commercial and industrial projects, tourism
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**Specialist Reviews** - specialist reviews of all processes required in terms of the National Environmental Management Act.

**Public Participation** - has undertaken numerous public participation processes, ranging from basic to extensive, as required by relevant environmental legislation.

In February 2002 he was appointed as Vuka’s National Environmental Project Manager, responsible for environmental project management and assessment for the “Parks Empowering People” (PEP) programme, a poverty relief effort (R760 million) of the National Department of Environmental Affairs and Tourism (DEAT) in Kruger-, Mapungubwe-, Kgalagadi-, Richtersveld-, Namaqua-, Augrabies Falls-, Golden Gate-, Addo Elephant-, Agulhas- and Wilderness National Parks.
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1. INTRODUCTION

Delron Consulting cc was commissioned by Infrasors Holdings Limited to conduct an environmental sensitivity analysis in order to assist in determining the development potential of the Remainder of Portion 55 of the Farm Pienaarspoort 339-JR (measuring approx. 502 hectares) and of the Remainder of Portion 10 of the Farm Pienaarspoort 339-JR.

1.1 LOCALITY

The subject properties are situated North of the R104, East of the R483, South of the R513 and West of Mamelodi Extensions 18 and 22 in the jurisdiction of the new amalgamated City of Tshwane Metropolitan Municipality.

1.2 PURPOSE OF THE SCREENING REPORT

In terms of the principles of Integrated Environmental Management (IEM) requiring environmental considerations to be integrated into a development formulation process, it is the responsibility of the proponent and supporting planners to respond, as fully and as early as possible, to the environmental implications arising from a development proposal. This should ideally be undertaken prior to the application for environmental authorisation and/or the initiation of any formal process of environmental assessment.

Environmental Screening is the process by which key environmental issues associated with a proposed development are anticipated at the earliest opportunity, and are considered as an integral part of the formulation of a site development plan. Potential significant environmental impacts also have to be anticipated, and mitigation options accommodated in initial development designs. It is a process that takes the form of a preliminary environmental evaluation.

An important aim of the pre-application screening is to establish whether there are aspects of the proposal that are either technically flawed or have the potential to give rise to significant or un-acceptable environmental consequences – the identification of potential “fatal flaws”. The identification of fatal flaws should include an analysis of the following:

- Ecological fatal flaws – identify and evaluate the ecological assets of the target area and predict the consequences and impacts of the proposed development on these assets.

Environmental screening thus aims to establish whether a proposed development is flawed in terms of anticipated environmental impacts and whether or not the proposal needs to be authorised by the competent authority. Environmental screening could therefore:

- eliminate the need for further environmental assessment, because the proposal has been abandoned on the basis of the fatal flaw analysis;
- eliminate the need for further environmental assessment, because there is certainty that the proposal will not require environmental authorisation to proceed;
- require adjustments to be made to the proposal prior to submission of the application to the authorities to authorise the activity.

2. DESCRIPTION OF THE ENVIRONMENT

2.1 GENERAL

The study area is situated in the summer rainfall region with a mean annual precipitation of between 600 to 750mm in two different vegetation types i.e. the Marikana Thornveld (SVcb 6) and the Gold Reef Mountain Bushveld (SVcb 9) (Mucina & Rutherfort, 2006). SVcb 6 is mostly underlain by the mafic intrusive rocks of the Rustenburg Layered Suite of the Bushveld
Complex. Vertic melanic clays with some dystrophic or mesotrophic plintic catena’s and some freely drained (sandy), deep soils occur in this vegetation type. The landscape of SVcb 9 is dominated by rocky hills and ridges, which are often west-east trending with more dense woody vegetation on the south-facing slopes and variable woody cover elsewhere. Tree and shrub layers are often continuous and the herbaceous layer is dominated by grasses.

The geology of the area consists mostly of quartzites, conglomerates and some shale horizons of the Magaliesberg, Daspoort and Silverton Formations of the Vaalian Pretoria Group as well as the Hospital Hill, Turffontein and Government Subgroups of the Randian Witwatersrand Supergroup. Soils are mostly shallow, gravel lithosols of the Mispah and Glenrosa forms (Mucina & Rutherfort, 2006).

2.2 TOPOGRAPHY

The topography of the site is described as sloping in a southern and eastern direction, with the Magaliesberg range forming a natural barrier along the western boundary of the subject property. The subject property is divided into two halves by a non-perennial flowing from north to south.

There is an elevation difference of approximately 174 m between the upper and lower portions of the investigated area which is located between approximately 1 503 m and 1 329 m above mean sea level.

Steep gradients in excess of 18° will render an area along the southern and western side of Portion 55 unsuitable for development.

A prominent perennial watercourse is present towards the southern portion of the property. The watercourse is draining towards the west in the direction of the more prominent Edendalspruit. Two river and riparian zones and associated wetlands are present on site.

2.3 GEOLOGY AND SOIL

The soil on the site is predominantly of the Hutton form, which is comprised of an Orthic A horizon overlying a red apedal B horizon. These soils are, thanks to the vegetation cover, not likely to erode on the relatively gentle slopes found on site. The soils are deep, with a B-horizon extending as far as beyond two metres below the A-horizon.

The area does, however, have a non-perennial river flowing through it, roughly in line with the overhead power cables. In the riverbed the Champagne soil form was found, which is comprised of an organic A horizon, or in layman's terms, peat, this implies the existence of a wetland.

Almost the entire eastern parts of Portion 55 are suitable for development however some geotechnical constraints, such as compressible and/or expansive soils may be encountered. The western parts of Portion 55 appear to be suitable for development.

2.4 HYDROLOGY

2.4.1 Surface Hydrology

Rainwater and groundwater will mainly drain as sheet wash and shallow groundwater seepage towards the lower slopes in the direction of the existing drainage channels. The water from the eastern part of the property will generally drain in a southern direction, although most will collect in the non-perennial mentioned.
2.4.2 Catchment Area Characteristics

The following table indicates the catchment area characteristics of the affected catchment areas. As shown in the table, the subject property sub-catchment is less than 0.1% in size of that of the quaternary catchment area.

Table 1: Catchment Area Characteristics

<table>
<thead>
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<th>Catchment Area</th>
<th>Catchment A23A</th>
<th>Property Sub-Catchment</th>
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<tbody>
<tr>
<td>Area (km²)</td>
<td>758.64</td>
<td>35.43</td>
</tr>
<tr>
<td>Length (km)</td>
<td>1750.62</td>
<td>47.2</td>
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<tr>
<td>Rainfall (mm)</td>
<td>705</td>
<td>707</td>
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<tr>
<td>Drainage Density (km/km²)</td>
<td>2.308</td>
<td>1.332</td>
</tr>
<tr>
<td>MAR (m³)</td>
<td>534,841</td>
<td>25,049</td>
</tr>
</tbody>
</table>

2.4.3 Normal Dry Weather Flow

In the non-perennial watercourse, no normal dry weather flow was observed, although the wetland characteristics in the lower regions suggest that during summer months (the raining season), some water flow is observed. In the perennial watercourse that forms the southern boundary of the property flow is observed all year round, except during particularly dry seasons.

2.4.4 Water Use

Water use in the area is believed to be allocated mostly towards existing mining activities, agriculture with some domestic use.

2.4.5 Wetlands

The perennial stream to the south of the property displays definite wetland properties. As this is one of the very few relatively undisturbed wetlands in the Roodeplaat dam catchment area, this wetland system must be protected.

2.4.6 Groundwater

Due to the absence of boreholes on the property, very little is known about the groundwater in the area. The ground water table is expected to occur at a depth of between more that 2m below normal ground surface.

2.5 VEGETATION

The following information has been extracted from a specialist vegetation diversity study as conducted by Environment Research Consulting during February 2008.

2.5.1 Conservation Status

The conservation status of the Marikana Thornveld (SVcb 6) is considered by Mucina & Rutherfort (2006) to be endangered with less than 1% statutorily conserved in i.e. the Magaliesberg Nature Area. Small portions are also conserved mainly in the De Ondersteypoort Nature Reserve. SVcb 6 is considerably impacted with 48% transformed as a result of cultivation and urban and industrial development. The Gold Reef Mountain Bushveld vegetation type (SVcb 9) is recorded by Mucina & Rutherfort (2006) as least threatened as some 22% of this vegetation type is statutorily conserved mainly in the Magaliesberg Nature Area and in smaller proportions in the Rustenburg, Wonderboom and Suikerbosrand Nature Reserves.
with at least an additional 1% conserved in other reserves. About 15% of the Gold Reef Mountain Bushveld (SVcb 9) is transformed, mainly by cultivation, and urban and built-up areas (Mucina & Rutherfort, 2006).

2.5.2 Plant Diversity

A total of 311 plant species were identified in the surveyed area, which indicates very high species diversity. The woody layer (trees & shrubs) is represented by 58 species. The herbaceous layer is made up of 79 grass species, 167 herbaceous shrubs and forbs and 11 sedges. The high species diversity can be attributed to the fact that the study area is situated on the transition between two different vegetation types (SVcb 6 & 9), but also to low levels of anthropogenic disturbance. Also the mountain habitat provides many different micro-habitats along cliff faces, under rocks, in cracks, in depressions where soil can accumulate, natural drainage lines, etc.

2.5.3 Description of Vegetation Units & Dominant Plant Species

Five main vegetation units were identified, they are:

i. The *Themeda triandra* – *Digitaria eriantha* Open Grassland

ii. The *Acacia caffra* – *Themeda triandra* Rocky Woodland

iii. The *Englerophytum magalismontanum* – *Loudetia simplex* Mountain Woodland

iv. The *Mundulea sericea* – *Xerophyta retinervis* Mountian Grassland

v. The *Eragrostis inamoena* – *Leersia hexandra* Riverine Wetland

i. **The Themeda triandra – Digitaria eriantha Open Grassland**

The *Themeda triandra* – *Digitaria eriantha* Open Grassland vegetation unit is situated in the Marikana Thornveld vegetation type (SVcb 6) (Mucina & Rutherfort, 2006) on undulating foot slopes of the mountain range to its southwest. It is dominated by the herbaceous layer with a poorly developed woody component. The woody species that do occur in this vegetation unit are mostly shrubs and dwarf shrubs. The soils vary from deep sandy soils to shallow sandy soils on rocky outcrops.

The dominant woody species occurring in this vegetation unit are the woody shrub *Diospyros lycioides* and dwarf shrubs *Elephantorrhiza elephantina*, *Pygmaeothamnus zeyheri*, *Dichapetalum cymosum*, and *Ziziphus zeyherana*. The dominant grass species are *Themeda triandra* and *Digitaria eriantha* with *Aristida canescens*, *A. stipitata*, *Brachiaria serrata*, *Cymbopogon poppischilli*, *Eragrostis curvula*, *E. lehmanniana*, *E. pallens*, *Hyparrhenia hirta*, *Setaria sphacelata*, *Trichoneura grandiglumis*, and *Urelytrum agropyroides* high in abundance. Forbs with high abundance are *Hypoxis rigidula*, *Acalypha angustata*, *Chamaecrista comosa*, *Crabbea angustifolia*, *Dicoma macrocephala*, *Helichrysum nudifolium*, *Indigofera spicata*, *Monsonia burkeana*, *Nidorella anomalãa*, *Parinari capensis*, *Senecio inornatus* and *Vernonia galpinii*.

Although parts of the *Themeda triandra – Digitaria eriantha* Open Grassland vegetation unit has been disturbed by especially informal roads the largest part thereof appears to be in a good ecological condition.

ii. **The Acacia caffra – Themeda triandra Rocky Woodland**

This vegetation unit is situated in the Marikana Thornveld vegetation type (SVcb 6) (Mucina & Rutherfort, 2006), mostly on rocky outcrops in clumps on the undulating grassland plains of the previous vegetation unit at the foot of the mountain range to the southwest. The vegetation of the *Acacia caffra – Themeda triandra* Rocky Woodland is dominated by trees with a strongly developed herbaceous layer. Although it might be argued that this vegetation unit is actually part of the *Themeda triandra – Digitaria eriantha* Open Grassland vegetation unit it was decided to separately describe this unit as it may be possible to conserve it because of the fact that it makes out a small portion of the study area and it may be possible to develop around these areas so that they may become islands for the conservation of a portion of the bio-diversity of the area.
The dominant woody species in this vegetation unit are *Acacia caffra*, *Burkea africana*, *Rhus pyroides*, *R. zeyheri*, and *Euclea crispa*. The dwarf shrubs *Ziziphus zeyherana*, *Elephantorrhiza elephantina*, *Pygmaeothamnus zeyheri*, and *Rhus gracillima* are also abundant. Other tree species of importance include *Cussonia paniculata*, *Cellis africana*, *Diospyros lycioides*, *Dombeya rotundifolia*, *Protea caffra*, *Rhus lancea*, and *Ziziphus mucronata*. Grass species that dominate the herbaceous layer are *Themeda triandra*, *Andropogon schirenisis*, *Diheteropogon ampectens*, *Eragrostis racemosa*, *Panicum maximum*, *Setaria verticillata*, and *Tristachya rehmannii*. The dominant forbs are *Acalypha angustata*, *Clematis brachiata*, *Ledebouria revoluta*, *Justicia anagalloides*, *Lantana rugosa*, *Pavonia burchellii*, *Plectranthus species*, *Rubia horrida* and *Hermannia depressa*.

No serious forms of disturbance and degradation were noticed in this vegetation unit.

iii. The *Englerophytum magalismontanum – Loudetia simplex* Mountain Woodland

This vegetation unit occurs on shallow rocky sandy soils in the Gold Reef Mountain Bushveld vegetation type (SVcb 9) (Mucina & Rutherford, 2006). The vegetation is dominated by trees and shrubs and the herbaceous layer is moderately well developed and is dominated by grasses.

The dominant woody species in this vegetation unit are the tree *Englerophytum magalismontanum* and the dwarf shrub *Rhus magalismontana*. Other woody species of importance are *Vangueria parvifolia*, *Canthium mundianum*, *Lannea discolor*, *Ficus burkei*, *Nuxia congesta*, *Ochna pulchra*, *Strychnos pungens*, *Ximenia caffra* and *Zanthoxylum capense*. Woody shrubs include *Ancylobotrys capensis*, *Lannea edulis*, *Salacia rehmannii* and *Osyris lanceolata*. The grass species that dominate in the *Englerophytum magalismontanum – Loudetia simplex* Mountain Woodland vegetation unit are *Loudetia simplex*, *Aristida junciformis* and *Sporobolus pectinatus*. Other grass species of importance are *Andropogon chinensis*, *Aristida diffusa*, *Brachiaria nigropepata*, *Cymbopogon nardus*, *Digitaria monodactyla*, *Melinis nerviglumis*, *Panicum natalense* and *Tristachya rehmannii*. The forbs are dominated by *Cleome maculata*, *Oldenlandia herbacea*, *Rhynchosia nitens* and the sedge *Coleochloa setifera*. Other important forbs include the geophytes *Gladiolus dalenii*, *Haemanthus humilis*, and *Tritonia nelsonii* as well as the forbs and sedges *Commelina africana*, *Cyanotis lapidosa*, *Cyperus ruprestris*, *Ceratotheca triloba*, *Hemizygia canescens*, *Hibiscus calyphyllus*, *Indigofera oxytropis*, *Kalanchoe paniculata*, *Leonotis microphylla*, *Secamone parvifolia*, *Sutura caerulea* and *Tephrosia elongata*. Several fern species also occur in this vegetation unit of which *Cheilanthes hirta* and *Pellaea calomelanos* are the most dominant.

Ecologically this vegetation unit is in pristine condition. No signs of disturbance or degradation, other than a number of places where drilling took place, were noticed during the time of the study.

iv. The *Mundulea sericea – Xerophyta retinervis* Mountain Grassland

The *Mundulea sericea – Xerophyta retinervis* Mountain Grassland is situated in the Gold Reef Mountain Bushveld vegetation type (SVcb 9) (Mucina & Rutherford, 2006) in much the same habitat as the *Englerophytum magalismontanum – Loudetia simplex* Mountain Woodland. The sandy soil of this vegetation unit does however, appear do be deeper in some places than with that of the latter. The vegetation of this unit is dominated by the herbaceous layer with a moderately well developed woody layer consisting mostly of small trees and shrubs.

The moderately well developed woody layer is dominated by the trees *Mundulea sericea*, *Vangueria infausta*, *Burkea africana*, and *Ochna pulchra*. The shrubs and dwarf shrubs *Rhus magalismontana*, *Elephantorrhiza burkei*, *Cryptolepis oblongifolia* and *Osyris lanceolata* are high in abundance. The dominant grasses are *Loudetia simplex*, *Eragrostis nindensis* and *Sporobolus pectinatus* with the species *Brachiaria serrata*, *Diheteropogon ampectens*, *Eragrostis racemosa*, *Monocymbium cerasiiforme*, *Panicum natalense* and *Schizachyrium sanguineum* are also abundant.

The dominant forbs are the grass-like *Xerophyta retinervis* and *Cyanotis lapidosa* as well as the sedges *Coleochloa setifera* and *Bulbostylis hispidula*. Other forbs of importance include *Cleome maculata*, *C. monophylla*, *Acrutome hispida*, *Indigofera oxytropis*, *Rhynchosia minima*, *R. nitens* and *Sutura caerulea*. The fern *Pellaea calomelanos* is also abundant.
As with the previous vegetation unit the only signs of disturbance and degradation in this unit is where drilling recently took place. Ecologically this vegetation unit appears to be in a good condition.

v.  The *Eragrostis inamoea* – *Leersia hexandra* Riverine Wetland

Although this vegetation unit is not a continuous wetland it does form a series of mini wetlands as the semi-permanent stream comes down the mountain in the natural drainage line or ravine. Three such areas occur in the study area. The first ravine runs from west to east on the northern boundary of the study area, the second to the south of the proposed affected area and runs from south to north and the third running from west to east, in the middle of the study area. These ravines are situated mainly in the Gold Reef Mountain Bushveld vegetation type (SVcb 9) and drains into the Marikana Thornveld vegetation type (SVcb 6) (Mucina & Rutherfort, 2006) towards the Elandsspruit.

The *Eragrostis inamoea* – *Leersia hexandra* Riverine Wetland vegetation unit is a complex one and occurs along the whole of the ravine where water accumulates in depressions and areas with little or no slope. These depressions fill up with soil washed down by the stream and form specialized habitats for wetland vegetation. On either side of the stream the vegetation resembles that of the two mountain vegetation units with small differences. Here plants grow along cliff faces and under rocks in micro habitats where moisture accumulates and the heat of the sun cannot reach them. Some of these plant species are mentioned at the end of this description.

No woody vegetation occurs in the wetland vegetation unit itself. The banks of the stream do however support many woody plants which belong to the two mountain vegetation units described previously. Grass and sedge species dominate the vegetation of the *Eragrostis inamoea* – *Leersia hexandra* Riverine Wetland vegetation unit and include the indigenous grasses *Eragrostis inamoea*, *Leersia hexandra*, *Paspalum scrobiculatum*, *Setaria incrassata*, *Sporobolus africanus* and *Arundinella nepalensis*. The exotic grass species *Bromus catharticus* and *Paspalum urvillei* also occur. The dominant sedges are *Cyperus denudatus*, *C. leptocladus*, *C. sexangularis*, *Kyllinga erecta*, and *Lipocarpha nana*. The most important forbs include *Commelina subulata*, *Helichrysum setosum*, *Indigofera cryptandra*, *Oxalis obliquifolia*, *Plectranthus madagascariensis*, *Senecio erubescens*, *Stachys species*, *Utricularia arenaria* and *Xyris capensis*.

Ecologically the *Eragrostis inamoea* – *Leersia hexandra* Riverine Wetland vegetation unit is in a good condition. No major disturbances or degradation was observed. It may be important to note that of all the vegetation units identified in the study area the ravine includes the highest number of plant species endemic to this vegetation unit for the study area. In other words: a number of species occurring in the ravine do not occur in any other vegetation unit in the study area. Other than the grasses, sedges and most of the forbs mentioned above the other species confined to the ravine are the woody *Erythrina lysistemon*, *Pappea capensis* and *Ficus ingens* and the herbaceous *Dianthus mooiensis*, *Erica woodii*, *Scadoxus puniceus*, *Streptocarpus vandeleurii*, and at least one fern species.

2.6  ENDANGERED, RARE, AND PROTECTED PLANT SPECIES

Neither plant species which are described as red data species by Hilton-Taylor (1996) and SANBI (2007), nor species that are included in the red and orange plant list of Gauteng Nature Conservation (2006), nor any protected tree species as listed by the Department of Water Affairs and Forestry (DWAF) (2004), were encountered in the study area during the time of the study.

According to Riekert (2006) GDACE mentions that the study area is possibly habitat to the near threatened orchid species *Habenaria bicolor*. This is unlikely as the red and orange plant list of Gauteng Nature Conservation (2006) mentions that this species occurs at altitudes of higher than 1800m above sea level. The highest point of the study area is approximately 1550m above sea level.
2.7 EXOTIC PLANT SPECIES

Only 18 exotic plant species were observed in the study area of which four are woody species, two are grasses, and 12 are herbaceous forbs. The relationship of indigenous plant species versus exotics is approximately 16 : 1 with less than 6% of all the plant species in the study area recorded as being exotic. Of the 18 exotic plant species nine are described by Henderson (2001) as declared weeds or invaders (four woody and five herbaceous species).

2.8 SUMMARY & CONCLUDING REMARKS

With a total of 311 plant species recorded (293 indigenous and 18 exotic), in five different vegetation units, very high plant species diversity was recorded. Neither plant species which are described as red data species by Hilton-Taylor (1996) and SANBI (2007), nor species that are included in the red and orange plant list of Gauteng Nature Conservation (2006), nor any protected tree species as listed by DWAF (2004), were encountered in the study area during the time of the study. Generally the ecological condition of the study area is good and no major signs of disturbance or degradation were noticed. Some minor disturbances were observed in the form of roads, drilling sites and some ground clearing. The 18 exotic plant species that were recorded are low in abundance, which further points to overall low levels of disturbance in the study area.

The drainage line or ravine running from west to east through the centre of the subject property and the stream and wetland associated with it, does raise some concern. It is uncertain whether the stream running down the ravine is perennial or not. The occurrence of specific plant species such as the grasses Leersia hexandra and Arundinella nepalensis and the forbs Xyris capensis and Utricularia spp. Suggests that these areas are waterlogged for the largest part of the year and may be evidence of at least a semi-perennial water system. Although no red or orange data plant species were recorded in the ravine a number of locally rare species were recorded. If in fact the mentioned ravine or any other important drainage lines or wetlands are to be negatively affected or destroyed during the proposed township establishment the necessary authorization, permits, etc. need to be obtained from DWA.

Other than the concerns surrounding the mentioned ravine there are no major reasons on a floristic level why the proposed development cannot take place. The mountain vegetation units are in a pristine condition and all possible precautions should be made to conserve the ravines on the north and south of the proposed site as well as the rest of the mountain vegetation surrounding the proposed site. Physical disturbance of these areas should not be allowed at all.

2.9 MAMMALS

The following information has been extracted from the Specialist Report: Terrestrial Small Mammals Study (2008) undertaken by J.J. Kotze (Ecologist – Animals): Department of Nature Conservation of the Tshwane University of Technology.

2.6.1 Commonly Occurring Species

Class: Mammalia (Mammals)

Four small mammal species were captured on site using perspex traps. Tracks and signs of five small mammal species seen on site were also recorded and added to the species list. Additional mammals and bat species from the desktop study that could possibly occur in the area were also added to the species list.

2.6.2 Red Data Species

No Red Data species were recorded for the small mammals.
There are three small mammal species with Red Data status (Table 2) that could occur in the area. None of these small mammals were recorded during the surveys, but that does not exclude the possibility that they could be found in the area.

Table 2: Small mammals that could occur in the area with Red Data Status

<table>
<thead>
<tr>
<th>ENGLISH NAME</th>
<th>SCIENTIFIC NAME</th>
<th>STATUS</th>
</tr>
</thead>
<tbody>
<tr>
<td>1 Least dwarf shrew</td>
<td>Suncus infinitesimus</td>
<td>Indeterminate in South Africa</td>
</tr>
<tr>
<td>2 Lesser dwarf shrew</td>
<td>Suncus varilla</td>
<td>Indeterminate in South Africa</td>
</tr>
</tbody>
</table>

3. GDARD: CONSERVATION PLAN (C-PLAN 3)

In terms of the Gauteng Department of Agriculture and Rural Development (GDARD) Integrated Decision Support Layers (GIS Data) the following aspects are relevant to the subject property:

3.1 WATERCOURSES

Figure 1 below indicates that several streams traverse the property. In terms of the GDARD Requirements for Biodiversity Assessments, rivers and streams are considered sensitive environments. Accordingly it is a requirement that the 1:100 year and 1:50 year flood lines are delineated. Furthermore, a 100m buffer zone from the edge of the riparian zone for rivers/streams outside the urban edge and a 32m buffer zone from the edge of the riparian zone for rivers/streams within the urban edge should be delineated. The riparian zone must be delineated according to “DWAF, 2003: A Practical Guideline Procedure for the Identification and Delineation of Wetlands and Riparian Zones”.

When a river/stream and/or wetland are present on site, the following mitigatory measures are recommended:

- No activity such as temporary housing, temporary ablution, disturbance of natural habitat, storing of equipment or any other use of the buffer/flood zone whatsoever, may be permitted. The demarcated buffer/flood zone must be fenced during the construction phase to prevent any misinterpretation of the demarcated no-go zone.
- The crossing of natural drainage systems must be minimized and may only be constructed at the shortest possible route, perpendicular to the natural drainage system. Bridge crossings must span the entire stretch of the flood line or buffer zone.
- No surface stormwater generated as a result of the development may be directed directly into any natural drainage system or wetland. A comprehensive surface runoff and stormwater management plan, indicating the management of all surface runoff generated as a result of the development (during both the construction and operational phases) prior to entering any natural drainage system or wetland, must be submitted (e.g. stormwater and flood retention ponds). This surface stormwater management plan must indicate how surface runoff will be retained outside of the demarcated buffer/flood zone, and how the natural release of retained surface runoff will be simulated so as not to impact on the natural hydrology and morphology of the river and the riparian zone.
- Special care needs to be taken during the construction phase to prevent surface stormwater rich in sediments and other pollutants from entering the natural drainage systems / wetlands. In order to prevent erosion, mechanisms are required for dissipating water energy.
- A comprehensive plan for limited recreational development (trails, bird hides etc.) within any riparian zone on the development site must be included in the EMP to be submitted for approval.
3.2 IMPORTANT AND/OR IRREPLACEABLE BIODIVERSITY AREAS

The Gauteng Department of Agriculture and Rural Development’s Conservation Plan (C-Plan 3) shows the north-eastern portion of the site as an “important” area and the eastern portion as an “ecological support” area. This is likely due to the anticipated/potential occurrence of “Red Listed Plant Habitat, Red Listed Bird Habitat, Red Listed Mammal Habitat and Primary Vegetation in the “Important Area”. Refer to Figure 2.

The mapping is at a broad scale and subject to ground truthing. GDARD will call for Biodiversity Studies to be undertaken as part of the EIA process and specialist will have to be appointed to undertake the flora and fauna biodiversity assessments, with specific attention to Red Data Listed species, habitats, wetlands and biodiversity.

3.3 RIDGES

A portion of the property is situated on a “Class 2” Ridge. In terms of the GDARD Development Guidelines for Ridges, “Class 2” ridges include ridges of which 5% to 35% of their surface area has been converted to urban development, quarries and/or alien vegetation. Figure 3 below provides an indication of the “Class 2” ridge in relation to the property.

The general guidelines on ridges are applicable to the use and development of the different classes of ridge. The following is applicable for “Class 2 Ridges”:

- The consolidation of properties on “Class 2” ridges is supported.
- The subdivision of property on “Class 2” ridges will not be permitted.
- Development activities and uses that have a high environmental impact on a Class 2 ridge will not be permitted.
- Low impact development activities, such as tourism facilities, which comprise of an ecological footprint of 5% or less of the property may be permitted. (The ecological footprint includes all areas directly impacted on by a development activity, including all paved surfaces, landscaping, property access and service provision).
- Low impact development activities on a ridge will not be supported where it is feasible to undertake the development on a portion of the property abutting the ridge.
Figure 2: Locality of Important & Irreplaceable Biodiversity Areas

Figure 3: Locality of "Class 2" Ridge
All ridges must be designated as sensitive. Already transformed areas (i.e. dominated by exotics, denuded of vegetation, landscaped, covered in development structures) can be ascribed a low sensitivity. Where the interface between the lower slopes and adjacent land is deemed important for certain species (e.g. low density herbivores recorded on site and important/rare invertebrates), a buffer zone of 200m must be mapped and designated as sensitive. A 200m buffer zone for Class 2 ridges must be designated as sensitive.

3.3.1 Recommended Standard Mitigatory Measures

- All areas designated as sensitive in a sensitivity mapping exercise must be incorporated into an open space system and registered against the title deeds as conservation servitude. Development must be located on the areas of lowest sensitivity.
- Connectivity between the open space system and adjacent natural vegetation / open space systems must be ensured.

4. SENSITIVITY MAP (FIGURE 4)

The objective of a sensitivity mapping exercise is to determine the location and extent of all sensitive areas that must be protected from transforming land uses. A development proposal is only considered compatible with the biodiversity sensitivities of the site if all sensitive areas are avoided and are incorporated into an open space system.
5. LEGAL ENVIRONMENTAL COMPLIANCE REQUIREMENTS


The statutory mechanism of issuing environmental authorisations, which follow after the undertaking of an environmental assessment process, is a tool utilised by the relevant authorities to ensure that activities undertaken do not cumulatively have an unacceptable negative impact on the environment. The current listed activities and authorisation process promulgated in terms of section 24 of the NEMA commenced on 2 August 2010 (save for those listed activities in respect of mining which will commence at a date to be published).

Section 24 of the NEMA, headed “Environmental Authorisations”, sets out the provisions which are to give effect to the general objectives of Integrated Environmental Management (“IEM”), as laid down in Chapter 5 of the NEMA. In terms of section 24(1), the potential impact on the environment of listed activities must be considered, investigated, assessed and reported on to the competent authority charged by the NEMA with granting of the relevant environmental authorisation.

Accordingly, the listed activities for which an environmental authorisation is required have been promulgated in three different government notices, namely:

- Government Notice R 544 in Government Gazette No. 33306 dated 18 June 2010 (“Listing Notice 1”), which identifies those activities for which a basic assessment (“BA”) must be undertaken in accordance with the procedure set out in regulations 21 to 25 of GNR 543 in Government Gazette No. 33306 of 18 June 2010 (“GNR 543”);
- Government Notice R 545 in Government Gazette No. 33306 dated 18 June 2010 (“Listing Notice 2”), which identifies those activities for which a scoping and environmental impact reporting (“S&EIR”) must be undertaken in accordance with the procedure set out in regulations 26 to 35 of GNR 543; and
- Government Notice R 546 in Government Gazette No. 33306 dated 18 June 2010 (“Listing Notice 3”), which identifies those activities within specific geographical areas for which a BA must be undertaken in accordance with the procedure set out in regulations 21 to 25 of GNR 543.

It must be noted that Listing Notice 1 and Listing Notice 3 pertain to those activities which are deemed to have a lesser environmental impact whilst those listed in Listing Notice 2 have a more significant impact on the environment and accordingly, a more detailed and extensive level of assessment is required to be undertaken.

It is clear that certain listed activities in terms of Listing Notice 1, 2 and 3 will be triggered by the proposed Leeuwsfontein Extension 20 Township establishment.

5.1.1 Identification of Listed Activities applicable to the Project

We set out below those listed activities contained in Listing Notice 1, 2 and 3 which in our view will be triggered by the proposed development and which will require prior environmental authorisation in terms of section 24 of the NEMA. The identification of the listed activities is based on the information provided to us.

In interpreting the listed activities provided for in Listing Notice 1, Listing Notice 2 and Listing Notice 3, it is important to take note of the following definitions:

“Construction” means:

“the building, erection or establishment of a facility, structure or infrastructure that is necessary for the undertaking of a listed or specified activity but excludes any modification, alteration, or expansion of such a facility, structure or infrastructure and excluding the reconstruction of the same facility in the same location, with the same capacity and footprint.”
### Table 3: Activities which requires Environmental Authorisation

<table>
<thead>
<tr>
<th>Activity</th>
<th>Activity No.</th>
<th>Activity Description</th>
<th>Description</th>
</tr>
</thead>
<tbody>
<tr>
<td>GN No. R. 544: 18 June 2010 – Listing Notice 1</td>
<td>11 (i) (ii) (iii) (vi) (x) (xi)</td>
<td>“The construction of: (i) canals; (ii) channels; (iii) bridges; (vi) bulk storm water outlet structures; (x) buildings exceeding 50 square metres in size; or (xi) infrastructure or structures covering 50 square metres or more - where such construction occurs within a watercourse or within 32 metres of a watercourse, measured from the edge of a watercourse, excluding where such construction will occur behind the development setback line”.</td>
<td>• Bridges / stream crossings • Bulk storm water outlets</td>
</tr>
<tr>
<td>GN No. R. 544: 18 June 2010 – Listing Notice 1</td>
<td>18 (i) (ii)</td>
<td>“The infilling or depositing of any material of more than 5 cubic metres into, or the dredging, excavation, removal or moving of soil, sand, shells, shell grit, pebbles or rock from (i), a watercourse, but excluding where such infilling, depositing, dredging, excavation, removal or moving (i) is for maintenance purposes undertaken in accordance with a management plan agreed to by the relevant environmental authority; or occurs behind the development setback line”.</td>
<td>• Earthworks at bridges / stream crossings</td>
</tr>
<tr>
<td>GN No. R. 544: 18 June 2010 – Listing Notice 1</td>
<td>23 (ii)</td>
<td>“The transformation of undeveloped, vacant or derelict land to – (ii), residential, retail, commercial, recreational, industrial or institutional use, outside an urban area and where the total area to be transformed is bigger than 1 hectare but less than 20 hectares.”</td>
<td>• For the transformation of undeveloped and vacant land bigger than 1 hectare.</td>
</tr>
<tr>
<td>GN No. R. 544: 18 June 2010 – Listing Notice 1</td>
<td>37</td>
<td>“The expansion of facilities or infrastructure for the bulk transportation of water, sewage or storm water where: (a) the facility or infrastructure is expanded by more than 1000 metres in length; or (b) where the throughput capacity of the facility or infrastructure will be increased by 10% or more – excluding where such expansion (i) relates to transportation of water, sewage or storm water within a road reserve; or (ii) where such expansion will occur within urban areas but further than 32 metres from a watercourse, measured from the edge of the watercourse”.</td>
<td>• Sewage package plant • Connector sewers • New water reticulation</td>
</tr>
<tr>
<td>GN No. R. 544: 18 June 2010 – Listing Notice 1</td>
<td>39 (i) (ii) (iii) (v)</td>
<td>“The expansion of (i) canals; (ii) channels; (iii) bridges; (v) bulk storm water outlet structures; within a watercourse or within 32 metres of a watercourse, measured from the edge of a watercourse, where such expansion will result in an increased development footprint but excluding where such expansion will occur behind the development setback line”.</td>
<td>• Upgrading / improvement of bridges</td>
</tr>
<tr>
<td>GN No. R. 545: 18 June 2010 – Listing Notice 2</td>
<td>15</td>
<td>“Physical alteration of undeveloped, vacant or derelict land for residential, retail, commercial, recreational, industrial or institutional use where the total area to be transformed is 20 hectares or more; except where such physical alteration takes place for: (i) linear development activities; or (ii) agriculture or afforestation where activity 16 in this Schedule will apply”.</td>
<td>• For the transformation of land bigger than 20 ha</td>
</tr>
</tbody>
</table>

<table>
<thead>
<tr>
<th>Activity</th>
<th>Activity No.</th>
<th>Activity Description</th>
<th>Description</th>
</tr>
</thead>
<tbody>
<tr>
<td>GN No. R. 546: 18 June 2010 – Listing Notice 3</td>
<td>13</td>
<td>The clearance of an area of 1 hectare or more of vegetation where 75% or more of the vegetative cover constitutes indigenous vegetation, except where such removal of vegetation is required for: (1) the undertaking of a process or activity included in the list of waste management activities published in terms of section 19 of the National Environmental Management: Waste Act, 2008 (Act No. 59 of 2008), in which case the activity is regarded to be excluded from this list. (2) the undertaking of a linear activity falling below the thresholds mentioned in Listing Notice 1 in terms of GN No. 544 of 2010. (d) In Gauteng: v. Sites identified as irreplaceable or important in the Gauteng Conservation Plan.</td>
<td>• Site clearing</td>
</tr>
<tr>
<td>GN No. R. 546: 18 June 2010 – Listing Notice 3</td>
<td>16</td>
<td>The construction of: (iii) buildings with a footprint exceeding 10 square metres in size; or (iv) infrastructure covering 10 square metres or more where such construction occurs within a watercourse or within 32 metres of a watercourse, measured from the edge of a watercourse, excluding where such construction will occur behind the development setback line. (b) In Gauteng: v. Sites identified as irreplaceable or important in the Gauteng Conservation Plan.</td>
<td>• Construction of buildings and infrastructure within a watercourse or within 32m of a watercourse.</td>
</tr>
</tbody>
</table>

In terms of the aforementioned, specifically Activity 15 of Listing Notice 2, the proposed development is subject to environmental authorisation in terms of a Scoping and Full EIA as per the NEMA EIA Regulations 2010.

5.2 NATIONAL WATER ACT (NWA) (ACT NO. 36 OF 1998)

The National Water Act (NWA), 1998 (Act 36 of 1998) is the primary statute providing the legal basis for water management in South Africa and has to ensure ecological integrity, economic growth and social equity when managing and using water.

Section 21 of the NWA specifies a number of water uses, including:

- 21(a) taking water from a water resource;
- 21(b) storing water;
- 21(c) impeding or diverting the flow of water in a watercourse;
- 21(d) engaging in a streamflow reduction activity contemplated in Section 36 of the Act;
- 21(e) engaging in a controlled activity identified as such in section 37(1) or declared under section 38(1);
- 21(f) discharging waste or water containing waste into a water resource through a pipe, canal, sewer, sea outfall or other conduit;
- 21(g) disposing of waste in a manner which may detrimentally impact on a water resource;
- 21(h) disposing in any manner of water which contains waste from, or which has been heated in, any industrial or power generation process;
- 21(i) altering the bed, banks, course or characteristics of a watercourse;
- 21(j) removing, discharging or disposing of water found underground if it is necessary for the efficient continuation of an activity or for the safety of people; and
- 21(k) using water for recreational purposes.
These water uses require authorisation in terms of the NWA. Authorisation can be obtained through the application for a Water Use License or registration of the water use activity in terms of the General Authorisation (GA) with the DWA. Section 22(1) of the NWA stipulates the conditions under which water use is permitted.

In terms of Section 39 of the NWA, a procedure is available to enable the responsible authority to permit specific water uses by publishing a GA in the Gazette. A GA can be restricted to a specific water resource, a category of persons, a defined geographical area or a period of time. Despite registering a water use in terms of the GA, conformity with other relevant laws are still required. The use of water under a GA does not require a licence until the GA is revoked, in which case licensing will be necessary. A GA does not replace or limit an entitlement to use water, such as an existing lawful water use or a licence, which a person may otherwise have under the NWA.

Based on the nature of the proposed project and proximity to existing water features, a Water Use License Application (WULA) will likely be required.

6. CONCLUSION AND RECOMMENDATIONS

The proposed Township Establishment: Leeuwfontein Extension 20 (Situated on A Part of Portion 55 (A Portion of Portion 1) of The Farm Pienaarspoort 339 JR) will require environmental authorisation in terms of section 24 of the NEMA due to the possible activation of certain listed activities contained in Listing Notices 1, 2 and 3 to that Act as set out in the body of this Report.

In terms of the GDARD Requirements for Biodiversity Assessments, rivers and streams are considered sensitive environments. Accordingly it is a requirement that the 1:100 year and 1:50 year flood lines are delineated. Furthermore, a 100m buffer zone from the edge of the riparian zone for rivers/streams outside the urban edge and a 32m buffer zone from the edge of the riparian zone for rivers/streams within the urban edge should be delineated. The riparian zone must be delineated according to “DWAF, 2003: A Practical Guideline Procedure for the Identification and Delineation of Wetlands and Riparian Zones”.

A 200m buffer zone for Class 2 ridges must be designated as sensitive.

All areas designated as sensitive in a sensitivity mapping exercise must be incorporated into an open space system and registered against the title deeds as conservation servitude. Development must be located on the areas of lowest sensitivity. Connectivity between the open space system and adjacent natural vegetation / open space systems must be ensured.

There are no ecological fatal flaws that militate against advancing to the next phase of the environmental assessment process, which is a Scoping / EIA Report, the environmental screening will provide a good foundation upon which the EIA process can proceed.

The Applicant should conduct a legal validation to identify all the water use activities associated with this project that will require authorisation by the Department of Water Affairs.