Draft Basic Assessment Report

Reference: GAUT 002/19-20/E2506

Proposed Tuna Park Open Space Project, City of Ekhuruleni Municipality, Nigel Gauteng

January 2020

Prepared by:

NuLeaf PLANNING & ENVIRONMENTAL

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FOREWORD

This report constitutes the **Draft Basic Assessment Report**, and has been circulated digitally for Stakeholder Comment on 06 February 2020.

NuLeaf Planning and Environmental would like to thank all Stakeholders for their participation and input into this process to date, and hereby invite Stakeholders to review this draft report and to provide feedback, input, concerns and comments.

All written comments received, including NuLeaf's response to each, will be captured in a Comments and Responses Register, which will be made available to all I&AP's and included in the Final Basic Assessment Report for submission to the Gauteng Department of Agriculture and Rural Development (GDARD).

All comments on the Draft BAR must be **in writing** and must reach NuLeaf by no later than close of business on **10 March 2020**.

Please mark all comments for the attention of:

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ACRONYMS AND ABBREVIATIONS

BA:	Basic Assessment
BAR:	Basic Assessment Report
CBA:	Critical Biodiversity Area
CMP:	Construction Management Plan
DARDLEA:	Mpumalanga Department of Agriculture, Rural Development, Land and Environmental Affairs
DWS:	South African National Department of Water and Sanitation
EA:	Environmental Authorisation
ECO:	Environmental Control Officer
EIA:	Environmental Impact Assessment
EMPr:	Environmental Management Programme
EMS:	Environmental Management System
EO:	Environmental Officer
I&AP:	Interested and Affected Party
IDP:	Integrated Development Plan
IEM:	Integrated Environmental Management
KNP	Kruger National Park
LED:	Local Economic Development
MTPA:	Mpumalanga Tourism and Parks Agency
NEMA:	National Environmental Management Act, Act No. 107 of 1998
NEMPAA:	National Environmental Management: Protected Areas Act, Act No. 57 of 2003
NPAES:	National Protected Area Expansion strategy
OMP:	Operational Management Plan
SAHRA:	South African Heritage Resources Agency

GLOSSARY OF TERMS

Alien Vegetation:	Alien vegetation defined as undesirable plant growth which shall include, but not be limited to all declared category 1 and 2 listed invader species as set out in the Conservation of Agricultural Resources Act (CARA) regulations.
Alien Species:	A plant or animal species introduced from elsewhere: neither endemic nor indigenous.
Alternatives:	In relation to a proposed activity, means different means of meeting the general purpose and requirements of the activity, which may include alternatives to: (a)The property on which or location where it is proposed to undertake the activity; (b) The type of activity to be undertaken; (c) The design or layout of activity; (d) The technology to be used in the activity; and (e) The operational aspects of the activity.
Applicant:	Any person who applies for an authorization to undertake an activity or to cause such activity to be undertaken as contemplated in the National Environmental Management Act (Act No. 107 of 1998), as amended and the Environmental Impact Assessment Regulations, 2010.
Buffer zone:	Is a collar of land that filters out inappropriate influences from surrounding activities, also known as edge effects, including the effects of invasive plant and animal species, physical damage and soil compaction caused by trampling and harvesting, abiotic habitat alterations and pollution. Buffer zones can also provide more landscape needed for ecological processes, such as fire.
Construction Activity:	Any action taken by the Contractor, his subcontractors, suppliers or personnel during the construction process.
Depression Wetland:	Endorheic wetland types that drain inward and are therefore not connected to the rest of the drainage network.
Ecology:	The study of the inter relationships between organisms and their environments.
Environment:	All physical, chemical and biological factors and conditions that influence an object and/or organism.
Environmental Impact:	An Impact or Environmental Impact is the degree of change to the environment, whether desirable or undesirable, that will result from the effect of a defined activity. An Impact may be the direct or indirect consequence of the activity and may be simple or cumulative in nature.
Environmental Impact Assessment:	Assessment of the effects of a development on the environment.
Environmental Management Programme:	A legally binding working document, which stipulates environmental and socio-economic mitigation measures that, must be implemented by several responsible parties throughout the duration of the proposed project.

Indigenous:	Means a species that occurs, or has historically occurred, naturally in a free state within the borders of South Africa. Species that have been introduced to South Africa as a result of human activity are excluded (South Africa (Republic) National Environmental Management: Biodiversity Act, 2004: Chapter 1).
Interested and Affected Party:	Any person, group of persons or organization interested in or affected by an activity contemplated in an application, or any organ of state that may have jurisdiction over any aspect of the activity.
Invasive vegetation:	Plant species that show the potential to occupy in unnatural numbers, any disturbed area, including pioneer species.
Mitigate:	The implementation of practical measures to reduce adverse impacts Public Participation Process: is a process in which potential interested and affected parties are given an opportunity to comment on, or raise issues relevant to, specific matters.
Public Participation:	The legislated process contemplated in terms GN R543, in which all potential interested and affected parties are informed of the proposed project and afforded the opportunity to input, comment and object. Specific requirements are listed in terms of advertising and making draft reports available for comment.
Road Reserve:	The road reserve is a corridor of land, defined by co-ordinates and proclamation, within which the road, including access intersections or interchanges, is situated. A road reserve may, or may not, be bounded by a fence.
Road Width:	The area within the Road Reserve including all areas beyond the Road Reserve that are affected by the continuous presence of the road i.e. the verge.
Red data plant species:	Are fauna and flora species that require environmental protection based on the World Conservation Union (IUCN) categories and criteria.
RoD:	Record of Decision pertaining to the Application for Environmental Authorisation issued by the Competent Authority. The RoD is legally binding on the Applicant and may contain a positive or negative decision on the Application as well as conditions and provisions for each.
Soil Compaction:	Mechanically increasing the density of the soil, vehicle passage or any other type of loading. Wet soils compact easier than moist or dry soils.
Species:	Means a kind of animal, plant or other organism that does not normally interbreed with individuals of another kind. The term “species” include any sub-species, cultivar, variety, geographic race, strain, hybrid or geographically separate population (South Africa [Republic] National Environmental Management: Biodiversity Act, 2004: Chapter 1).
The Contractor:	The contractor, as the developers agent on site, is bound by the ROD and EMP conditions through his/her contract with the developer, and is responsible for ensuring that conditions of the EMP and ROD are strictly adhered to at all times. The contractor must comply with all orders (whether verbal or written) given by the ECO, project manager or site agent in terms of the EMPr.

The Developer:	Remains ultimately responsible for ensuring that the development is implemented according to the requirements of the EMP and the conditions of the Environmental Decision throughout all phases of the project.
The Environmental Control Officer (ECO):	The ECO is appointed by the developer as an independent monitor of the implementation of the EMP i.e. independent of the developer and contractor.
The Environmental Officer (EO):	The Contractor shall submit to the Site Agent a nominated representative of the Contractor as an EO to assist with day to day monitoring of the construction activities for the contract.
Vegetation:	Is a collective word for plants occurring in an area.
Vulnerable:	A taxon is 'Vulnerable' when it is not 'Critically Endangered' or 'Endangered' but is facing a high risk of extinction in the wild in the medium term future.
Watercourse:	A river or spring; a natural channel in which water flows regularly or intermittently; a wetland, lake or dam into which, or from which, water flows; and any collection of water which the Minister may by notice in the Government Gazette, declare to be a watercourse, and a reference to a watercourse includes, where relevant, its bed and banks" (South Africa [Republic] National Water Act, 1998).

EXECUTIVE SUMMARY

The proposed development entails the open space development and rehabilitation of the area surrounding the Tuna Park Wetland. The rehabilitation of the open space system will consist of the restoration of the local biodiversity of the site, the introduction of pedestrian pathways and boardwalks within the outer disturbed wetland zone, as well as, the development and formalization of a community parks outside of the core wetland zone.

The proposed development falls within the Soweto Highveld Grassland vegetation type, classified as Threatened. Untransformed Soweto Highveld Grassland is a threatened ecosystem that is locally known as Blesbokspruit Highveld Grassland, which is a critically endangered ecosystem, however, Blesbokspruit Highveld Grassland patches on the study site are severely transformed by anthropogenic activities and no longer represent an untransformed (primary) grassland composition. A small portion of the study is also characterised as a Critical Biodiversity Area (CBA) and Ecological Support Area (ESA). No species of conservation importance were found on site. Seven Declared Weeds and Invader species were observed on the study site.

No cultural heritage sites were found within the study area.

The site is located in Quaternary Catchment C21E, within the Upper Vaal Water Management Area (WMA). Quaternary Catchment C21E has a largely modified (class D) Present Ecological State (PES) and a High Ecological Importance and Sensitivity (EIS). The entire site is dominated by a depression hydro-geomorphic (HGM) wetland unit that has been modified by infilling, dumping, alien plants, stormwater inflows and infrastructure, specifically sport fields and hard surface structures. Depression wetlands are endorheic wetland types that drain inward and are therefore not connected to the rest of the drainage network. The proposed development is not expected to cause further degradation of the wetland even though the activities are located within wetland habitat. The affected depression wetland is Severely modified (class E PES) and will remain in this PES class in spite of the proposed development on the condition that indigenous species are used for the proposed open space development and that alien control is applied. An opportunity is therefore available to improve wetland habitat through the removal, or partial removal, of existing infill material and the control of alien plant species. Even though the site is largely degraded, due to the majority of the site consisting of a wetland, the core wetland area as a whole is regarded as having a high ecological sensitivity.

The construction impacts, if effectively managed according to the mitigation measures proposed in this report, the specialist reports and the draft EMPr will have a predominately low residual significance rating. Positive Moderate post mitigation significance ratings are anticipated in terms of removal of invader alien species, stimulation of the local economy through the creation of short term employment.

The operational impacts are anticipated to have a predominately positive moderate to high significance post mitigation. Negative impacts are anticipated to be limited predominately to low significance post mitigation. It should, however, be noted that the impacts of continued dumping, as well as sewage spillage and overflow, if left unmanaged in the surrounding area, will result in an anticipated negative impact of high post mitigation significance. All rehabilitation works will be highly compromised, should these impacts be allowed to continue.

Positive impacts include job creation and employment opportunities for both the construction and operational phases, as well as, skills transfer and development.

Attributable to the denude condition of the site, monitoring the progress of future rehabilitation (re-colonisation of both fauna and flora as well as wetland functioning) as part of the construction and operational plans, is recommended in the study area.

Assuming that the above recommendations are implemented and adhered to, there is no reason why the proposed development should be supported due to the high overall positive impacts, particularly with regards to the improved environmental health and safety of the area, as well as, the many socio-economic community benefits. There are no fatal flaws to this project, and all potentially negative impacts may be mitigated through careful management during all phases of the project lifecycle. The Environmental Assessment Practitioner therefore recommends that the development be supported.

SECTION A: ACTIVITY INFORMATION

1. PROJECT DESCRIPTION

1.1. Development Components

The proposed development entails the open space development and rehabilitation of the area surrounding the Tuna Park Wetland. The rehabilitation of the open space system will consist of the restoration of the local biodiversity of the site, the introduction of pedestrian pathways and boardwalks within the outer disturbed wetland zone, as well as, the development and formalization of a community parks outside of the core wetland zone. The formalization of the surrounding open space will facilitate activities such as children's play areas, inclusion of existing sport fields into surrounding open space areas and activities, picnic areas, gathering spaces for open air worship etc., informal kick-about lawn areas, outdoor classroom, outdoor gym area as well as various streetscapes.

The intent of the proposed Tuna Park development is to develop an open space system that is integrated into the daily lives and hearts of the community – one that is safe, accessible and well managed, within which people feel at home.

The landscaping will entail:

- clean-up and rehabilitation of a severely polluted and degraded depression wetland
- development of a safe pedestrian pathway network along the outer fringe of the wetland linking the various local communities
- formalising a number of informal movement pathways within the wetland through the development of raised pedestrian boardwalks allowing for safe pedestrian movement and linking the northern portion of the site to the southern portion of the site
- planting of indigenous grasses, plants and trees throughout the terrestrial zone, focussing on nodes, access points and future park areas
- development of a coherent community park on a mostly denuded and disturbed area

Advantages of these sites for the proposed development include the following:

- Removal and disposal of existing dumping and waste
- Rehabilitation of a disturbed depression wetland
- Ensure public safety through the formalizing of movement routes, access points and crossings along the wetland system
- Reinstate ecological systems and environments to promote a healthier living environment for, not only the local community, but also the fauna and flora found within the area
- Act as a catalyst to ensure better water quality that is safe for human contact
- Develop much needed formalized public open space along the wetland for local community enjoyment
- Support and formalize appropriate and compatible existing activities within the open space, including sports, recreation, and open air worship
- Establish appropriate implementation and management systems which will allow for changing needs, opportunities and conditions
- Creating safe children's play areas
- Foster community buy-in and civic pride

- A less structured proposal could result in the over utilisation of this open space for activities not appropriate or beneficial to the environment, such as illegal dumping, extensive agriculture, informal / illegal development, etc.

Disadvantages of this site for the proposed activity include the following:

- Portion of the site is located within a Critical Biodiversity Area (CBA) and Ecological Support Areas (ESA) where development should proceed with discernment.
- Location of proposed infrastructure within 32m of a depression wetland

It is anticipated that the development will not only contribute to everyday needs and the general quality of life of the surrounding community, but will also add value to the greater environment through its integrated response to ecological and social needs. It is foreseen that this proposal will be implemented in three phases over a specified time period. The three phases will be as follows:

1. Phase 1: Sports Node
   This initial phase will incorporate the existing rugby fields into the surround open space areas through the removal of the sports field dilapidated fences to be rather replaced by multifunctional natural barriers such as berms. These berm areas will double up as seating and gathering space for when a sports event will take place. The removal of the fence will also assist in opening up safe community access to the open space from the north – Panview Lane and Kreef Avenue, creating a safe open space node. The inclusion of pause areas removed from the street edge will allow for quieter gathering spaces where various community or worship groups can gather together comfortably. Natural children's playgrounds will allow for exploration of the natural world within a safe bermed enclosed area. Areas where soils are waterlogged in certain parts of the year will be utilised as kick-about lawn areas.

2. Phase 2: Linear Wetland Node
   This phase will develop the Southern and western portion of the site. The genius loci of the structures found in this portion of the site will be incorporated into the aesthetics of the park. Pedestrian pathways and boardwalks are proposed along the wetland edge, as well as, the street edge to further contribute to the safe pedestrian network on site. The creation of shaded picnic and braai areas and formalisation of social gathering spaces is essential in this phase. Outdoor activities will also be encouraged through the introduction of an outdoor gym and children's playground area. This phase in the open space development will also link into the surrounding school facilities by providing an outdoor classroom area. Vehicular access will be prevented in this area through the installation of bollards along the street edge.

3. Phase 3: Civic Centre Node
   Phase 3 is the final development phase of the proposed development. It will consist of the construction of activities that support the existing facilities along the eastern portion of the site. This phase will include the development of a paved pedestrian pathways, creation of seating areas to allow for rest, inclusion of parking to cater for sports events and spill over for possible functions at the Mackenzieville Civic Centre, as well as, the installation of bollards to prevent vehicular access to the pedestrian boulevard.

1.2. Detailed description of the listed activities associated with the project as applied for

Government Notice R327 Activity No.	**Describe the relevant Basic Assessment Activity in writing as per Listing Notice 1 (GN No. R327)**	**Describe the portion of the development as per the project description that relates to the applicable listed activity**
12 (ii) (a) (c)	The development of (ii) infrastructure or structures with a	*The construction of the outdoor gym and gathering space, a playground,*

	physical footprint of 100 square metres or more where such a development occurs (a) within a watercourse or (c) within 32 metres of a watercourse.	*the outdoor classroom, terraced picnic area, natural gathering space, kick-about lawn area and gathering plaza within 32m of a watercourse, resulting in a combined physical footprint of 50000 m^2. These structures and infrastructure are located within a wetland or alternatively within 32m of the wetland.*
19 (i)	The infilling or depositing of any material of more than 10 cubic metres into, or the dredging, excavation, removal or moving of soil, sand, shells, shell grit, pebbles or rock of more than 10 cubic metres from (i) a watercourse	*The construction of Tuna Park will result in either the infilling, removal or moving of 10 cubic meters or more of materials such as sand, rocks or soil within the Wetland.*
27	The clearance of an area of 1 hectare or more, but less than 20 hectares of indigenous vegetation.	*The proposed open space development will clear a total of 11.2 ha of indigenous vegetation.*
Government Notice R324 Activity No:	**Describe the relevant Basic Assessment Activity in writing as per Listing Notice 3 (GN No. R324)**	**Describe the portion of the development as per the project description that relates to the applicable listed activity**
12 (c) (ii) (iii)	The clearance of an area of 300 square meters or more of indigenous vegetation in (c) Gauteng (ii) within critical biodiversity areas (iii) on land zoned open space, conservation or had an equivalent zoning.	*The proposed 111290 m^2 open space development of Tuna Park and its associated activities, will result in the combined clearance of more than 300 square meters of indigenous vegetation, within a portion of a Critical Biodiversity Area, on land which is zoned as open space.*
14 (ii) (a) (c); (c) (iv) (x)	The development of (ii) infrastructure or structures with a physical footprint of 10 square meters or more where such development occurs within (a) a watercourse or (c) within 32 m of a watercourse in (c) Gauteng in (iv) sites identified as CBA's and ESA's and (x) sites zoned for conservation or public open space.	*The construction of the outdoor gym and gathering space, a playground, the outdoor classroom, terraced picnic area, natural gathering space, kick-about lawn area and gathering plaza within 32m of a watercourse, resulting in a combined physical footprint of 50000 m^2. These structures and infrastructure are located within a site identified as a CBA and ESA of a, on land which is zoned as public open space.*

2. FEASIBLE AND REASONABLE ALTERNATIVES

2.1. Alternatives

No alternatives are under consideration for the proposed development.

2.2. Coordinates of proposed site

Please refer to the table below for the coordinates of the corners of the development site.

	Latitude (S):			Longitude (E):		
Corner 1	26°	26'	43.19"	28°	30'	57.10"
Corner 2	26°	26'	44.81"	28°	30'	38.91"
Corner 3	26°	26'	30.50"	28°	30'	36.20"
Corner 4	26°	26'	26.53"	28°	30'	46.96"
Corner 5	26°	26'	24.59"	28°	30'	50.07"
Corner 6	26°	26'	24.35"	28°	30'	54.12"
Centre of site	26°	26'	37.59"	28°	30'	44.35"

2.3. Physical size of the activity

	Size of the activity (Areas):
Tuna Park Landscape interventions	11.3 ha (111 290 m^2)

2.4. No- project Alternative

The No-Project Alternative implies that the proposed Open Space Project of Tuna Park and all associated infrastructure will not take place. In this scenario no negative environmental impacts relating to surface water and biodiversity will be incurred.

The No Project Alternative also implies that no positive impacts or benefits will be experienced such as the generation of employment opportunities, job creation and diversification of open space offerings in the region.

3. SITE ACCESS

Ready access is available to the proposed development site from various roads namely, Tuna Lane, Panview Lane, Ahzed Avenue and Sastri Drive via the R51.

4. LOCALITY MAP

Please refer to Appendix A.1 for the Locality Map.

5. LAYOUT/ ROUTE PLAN

Please refer to Appendix A.2 for the Layout Map and Appendix A.3 for the Phased Development Map.

6. SENSITIVITY MAP

Please refer to Appendix A.4 - A.8 for the site sensitivity maps.

7. SITE PHOTOGRAPHS

Please refer to Appendix B for Photographs taken at the 8 compass points.

8. FACILITY ILLUSTRATION

Please refer to Appendix C for the Facility Illustration(s).

9. ACTIVITY MOTIVATION

a) IDP, SDF other guidelines

Tuna Park is situated within the City of Ekurhuleni Local Municipality which is a key Metropolitan Municipality comprising of nine towns and seventeen townships. The City vastly differs from other major cities in South Africa due to their being no urban core; this means that a different approach to spatial and economic transformation would be required in order to link the different aspects of the city – one of which includes the maintenance and protection of open spaces.

The City of Ekurhuleni Local Municipality, like any major city, is facing an influx of migration from rural surrounding areas, this contributing to an already ever increasing population size. This means that the city is under pressure to provide enough housing and adequate services to a large amount of people while still complying with spatial justice. This phenomenon highlights the importance of the Integrated Urban Development Framework (IUDF) which sets out the policy framework for transforming and restructuring South Africa's urban spaces in such a way that they become 'liveable, safe, resource efficient cities and towns that are socially integrated, economically inclusive and globally competitive, where residents actively participate in urban life'. An important concept around this framework is the incorporation of making cities sustainable.

The Grand Open Space Plan is a document that serves as an integration of Open Space Management and planning within the Ekurhuleni region by merging a number of existing strategies and frameworks into one comprehensive document. It stresses the ecological and environmental importance of open space in urban settlements. Open spaces play an integrate role in improving urban climate, dispersing flood waters improving air quality while socially providing residence with the opportunity to develop a heathier lifestyle.

In this regard, the proposed Open Space Project of Tuna Park falls within a number of current policies, frameworks and guidelines.

b) Needs and Desirability

Tuna Park is located in Cerutiville between Mackenzieville and Alra Park within the City of Ekurhuleni Local Municipality. This area can be considered a low income area and therefore a target area which aims to accelerate and broaden access to quality municipal services to the poor, providing a safe and healthy environment to encourage community engagement and social development. The settlement area surrounding the site of the proposed open space project is highly concentrated with little free, safe open space for the residents to enjoy. This not only negatively impacts the natural environment of the area but plays a big role in the morale of the residents. An open space is not only visually pleasing to residents but will also provide them with a means at adopting a healthier lifestyle by giving them an area to enjoy outside recreational activities in a safe environment.

10. APPLICABLE LEGISLATION, POLICIES AND/OR GUIDELINES

The following legislation may also be applicable:

TITLE OF LEGISLATION, POLICY OR GUIDELINE	APPLICABILITY TO THE PROJECT	ADMINISTERING AUTHORITY	DATE
LEGAL FRAMEWORK			
Constitution of Republic of South Africa (Act No.108 of 1996):	This is the fundamental law of South Africa, setting out the Bill of Rights as well as the relationship of various government structures to each other.	National Government	1996
Conservation of Agricultural Resources Act (Act No. 43 of 1983):	Provides for control over the utilization of the natural agricultural resources of the Republic. The proposed project will be required in terms of this legislation to ensure that: The soil mantle is protected and conserved, The natural water sources are protected, Vegetative cover is conserved and weeds and invader plants are removed from the site.	Department of Agriculture	1983
National Environmental Management Act (Act No. 107 of 1998)	To provide for co-operative environmental governance by establishing principles for decision-making on matters affecting the environment, institutions that will promote cooperative governance and procedures for co-ordinating environmental functions exercised by organs of state; to provide for certain aspects of the administration and enforcement of other environmental management laws; and to provide for matters connected therewith.	Department of Environmental Affairs	1998
National Environmental Management: Protected Areas Act (Act No. 57 of 2003):	The Act provides for the protection and conservation of ecologically viable areas representative of South Africa's biological diversity and its natural landscapes and seascapes; for the establishment of a national register of all national, provincial and local protected areas; for the management of those areas in accordance with national norms and standards; for intergovernmental co-operation and public consultation in matters concerning protected areas, and for matters in connection therewith. The proposed development is adjacent to the Kruger National Park, a Protected Area in terms of this Act.	Department of Environmental Affairs	2003
National Environmental Management: Biodiversity Act (Act No. 10 of 2004):	The purpose of the Biodiversity Act is to provide for the management and conservation of South Africa's biodiversity within the framework set out by NEMA and the protection of species and ecosystems that warrant national protection. As part of its implementation strategy, the National Spatial Biodiversity Assessment was developed (see below). Rare or protected species may be affected during construction. The Act lists species that are threatened or require protection to ensure their survival in the wild, while regulating the activities, which may involve such listed threatened or protected species and	Department of Environmental Affairs	2004

	activities which may have a potential impact on their long-term survival. The Act has listed flora and fauna species.		
National Spatial Biodiversity Assessment, 2011:	The National Spatial Biodiversity Assessment (NSBA) classifies areas as worthy of protection based on its biophysical characteristics, which are ranked according to priority levels.	Department of Environmental Affairs	2011
National Forests Act (Act No. 84 of 1998):	This Act provides for the management, utilisation and protection of forests through the enforcement of permitting requirements associated with the removal of protected tree species, as indicated in a list of protected trees (first promulgated in 1976 and updated since). Although not anticipated, should any protected tree species require removal or relocation within the project area, a permit will be required.	Department of Agriculture, Forestry and Fisheries	1998
National Veld and Forest Fire Act (Act No. 101 of 1998)	The purpose of this Act is to prevent and combat veld, forest and mountain fires throughput the Republic. The Act provides for a variety of institutions, methods and practices for achieving this purpose.	Department of Water Affairs	1998
National Heritage Resources Act (Act No. 25 of 1999)	The National Heritage Resources Act legislates the necessity for cultural and heritage impact assessment in areas earmarked for development, which exceed 0.5 hectares (ha) and where linear developments exceed 300 metres in length. In this regard, the proposed development site will be subject to engagement with the South African Heritage Resources Agency (SAHRA). Potential impact on cultural heritage, paleontological or archaeological resources through excavation activities or disturbance will need to be monitored. Permits may be required per the National Heritage Resources Act (Act No. 25 of 1999).	South African Heritage Resources Agency (SAHRA)	1999
The National Water Act (Act No. 36 of 1998)	This Act aims to provide management of the national water resources to achieve sustainable use of water for the benefit of all water users. The proposed development will have to ensure that local water resources are protected, used, developed, conserved, managed and controlled in a responsible way.	Department of Water Affairs	1998
The National Water Services Act (Act No. 108 of 1997)	The Act legislates the necessity to provide for the rights of access to basic water supply and basic sanitation; to provide for the setting of national standards and of norms and standards for tariffs; to provide for water services development plans; to provide a regulatory framework for water services institutions and water services intermediaries; to provide for the establishment and disestablishment of water boards and water services committees and their powers and duties; to provide for the monitoring of water services and intervention by the Minister or by the relevant Province; to provide for financial assistance to water services institutions; to provide for certain general powers of the Minister; to provide for the gathering of information in a national information system and the distribution of that information; to repeal certain laws; and to provide for matters connected therewith.	Department of Water Affairs	1997

National Environmental Management Waste Act (Act No. 59 of 2008)	The Waste Act reforms the law regulating waste management in order to protect the environment by providing reasonable measures for the prevention of pollution and ecological degradation. The proposed development will be subject to this Act in terms of the disposal of waste.	Department of Environmental Affairs	2008
Hazardous Substances Act (Act No. 15 of 1973)	To provide for the control of substances which may cause injury or ill-health to or death of human beings by reason of their toxic, corrosive, irritant, strongly sensitizing or flammable nature or the generation of pressure thereby in certain circumstances, and for the control of certain electronic products; to provide for the division of such substances or products into groups in relation to the degree of danger; to provide for the prohibition and control of the importation, manufacture, sale, use, operation, application, modification, disposal or dumping of such substances and products; and to provide for matters connected therewith.	Department of Health	1973
National Environmental management Air Quality Act (Act No. 39 of 2004)	To reform the law regulating air quality in order to protect the environment by providing reasonable measures for the prevention of pollution and ecological degradation and for securing ecologically sustainable development while promoting justifiable economic and social development; to provide for national norms and standards regulating air quality monitoring, management and control by all spheres of government; for specific air quality measures; and for matters incidental thereto.	Department of Environmental Affairs	2004
Occupational Health and Safety Act, 1993 (Act No. 85 of 1993):	The purpose of this Act is to provide for the health and safety of persons at work and for the health and safety of persons in connection with the use of plant and machinery; the protection of persons other than persons at work against hazards to health and safety arising out of or in connection with, the activities of persons at work. The proposed development will therefore be subject to this Act during the construction and operational Application for Environmental Authorisation.	Department of Labour	1993
Integrated Environmental Management Information Series	IEM is a key instrument of NEMA and provides the overarching framework for the integration of environmental assessment and management principles into environmental decision-making. The aim of the information series is to provide general information on techniques, tools and processes for environmental assessment and Management. These various documents have been referred to for information on the most suitable approach to the environmental assessment process for the proposed development.	Department of Environmental Affairs	1992
Local Government: Municipal Structures Act, No. 117 of 1998	To provide for the establishment of municipalities in accordance with the requirements relating to categories and types of municipality; to establish criteria for determining the category of municipality to be established in an area; to define the types of municipality that may be established within each category; to provide for an appropriate division of functions and powers between categories of municipality; to regulate the internal systems, structures and office-bearers of municipalities; to provide for appropriate electoral systems; and to provide for matters in connection therewith	National Government	1998
Local Government: Municipal Systems Act,	To provide for the core principles, mechanisms and processes that are necessary to enable municipalities to move progressively towards the social and economic upliftment of local	National Government	2000

No. 32 of 2000	communities, and ensure universal access to essential services that are affordable to all; to define the legal nature of a municipality as including the local community within the municipal area, working in partnership with the municipality's political and administrative structures; to provide for the manner in which municipal powers and functions are exercised and performed; to provide for community participation; to establish a simple and enabling framework for the core processes of planning, performance management, resource mobilisation and organisational change which underpin the notion of developmental local government.		

11. WASTE AND EFFLUENT

11.1. Solid Waste Management

Solid waste will mainly be generated during construction for the proposed development.

Part of the construction phase will involve the removal of existing dumping (waste) throughout the site. This waste will be excavated and collected by contractor and removed to the nearest registered landfill site.

Additional solid waste produced during the construction of bridges, pathways, parks and other infrastructure will be disposed of by a contractor who will provide skips for the collection of waste and remove these on a regular basis to the nearest registered landfill site.

In addition, the following actions will be undertaken:

- The contractor will apply waste management techniques that aim to avoid and reduce the volume of waste generated overall.
- The contractor will develop and implement a comprehensive system for waste separation and recycling at source, prior to removal to landfill. Recyclables will be stored separately for collection by specialist contractor.
- Hazardous waste will be separated at source from the general waste stream. This will ensure that non-conforming waste does not enter the landfill site, as well as preventing cross contamination and potential risks to personnel and the environment. All hazardous waste transported from the site will be reconciled with safe disposal certificates to be issued by the waste management service provider. The disposal of hazardous waste is required to comply with all relevant Regulations, Norms and Standards pertaining to waste classification in order to ensure disposal at the correct landfill class.

Solid waste disposal during the operational phase will be undertaken by the municipal waste collection services. Removal will be on a regular basis to the nearest registered landfill site.

In addition, facilities for the separation of recyclable waste will be provided at the collection points. All recyclable waste will be disposed of at registered recycling facilities.

All garden refuse and organic waste will be processed on site and utilized in the making of compost needed for the maintenance and upkeep of parkland areas. Any excess compost can be sold locally should the need arise. Alternatively it will be brought to the nearest municipal garden refuse site for composting.

12. WATER USE

All water used for landscape irrigation will be sourced from municipal water.

13. POWER

Municipality or Eskom supplied power will be utilized where required. Low energy LED lighting will be used along pedestrian pathways and in parkland areas for external lighting where required.

Solar powered lighting is considered to be inappropriately expensive for this application.

SECTION B: SITE/AREA/PROPERTY DESCRIPTION

1. LAND USE CHARACTER OF SURROUNDING AREA

The study site is located in Cerutiville and is adjacent to Mackenzieville and Alra Park, situated in Nigel, within the city Ekurhuleni Municipality, Gauteng. The surface extent of the study site is approximately 32.5 ha in extent.

The study site consists of a natural wetland, informal public open space, sport fields and sport facilities. Most of the terrestrial natural vegetation on the study site shows signs of anthropogenic disturbances and grazing by livestock, with dumping of waste was present on most parts of the study site. The surrounding area corresponds to residential and build-up land. According to the 2013-2014 land cover dataset the study site consists primarily of build-up land and thicket vegetation.

Historically the area around Tuna Park has grown significantly. Historic aerial images sourced from between 1937-1991 where examined to determine the changes to the land use character of the surrounding area and site over time. 1991 saw the most significant changes to the site with the addition of the infilling of the wetland to develop the sports fields. These sports fields are still in use.

The historic aerial images also show that over the years the wetland has morphed from a natural vlei area to a more functional permanent water body that assists in storm water retention.

The existing conditions and issues found on the site include illegal dumping and burning of waste, pollution of the water through sewage leaks and litter, infilling and dumping of construction waste on the fringes of the wetland, dense reed growth in areas, aging infrastructure such as broken fencing and dilapidated fences, inadequate and blocked stormwater infrastructure, illegal structures and businesses within open space areas and lack of recreational activities.

Refer to Appendix C for a detailed status quo of the site.

2. GEOLOGY

The study site is underlain by shale and quartzite of the West Rand Group (Randian Erathem).

3. BIODIVERSITY

A specialist terrestrial ecology assessment was undertaken by Pachnoda Consulting CC in August 2019.

The study area corresponds to the Grassland Biome and more particularly to the Mesic Highveld Grassland Bioregion as defined by Mucina & Rutherford (2006). The proposed development represents an ecological type known as Soweto Highveld Grassland. Untransformed Soweto Highveld Grassland is a threatened ecosystem that is locally known as Blesbokspruit Highveld Grassland, which is a critically endangered ecosystem as per Section 52 of the National Environmental Management Biodiversity Act, (Act No. 10 of 2004). However, Blesbokspruit Highveld Grassland patches on the study site are severely transformed by anthropogenic activities and no longer represent an untransformed (primary) grassland composition.

Flora

A total of 67 plant species represented by 20 families were recorded within the study area during fieldwork.

No species of conservation importance as protected under the National Forests Act (No. 84 of 1998), NEMA Biodiversity Act (Act 10 of 2004, as amended in 2015 by Notice 255 of the Government Gazette, 31 March 2015,

No. 38600) or the Transvaal Nature Conservation Ordinance (to be replaced by the Gauteng Nature Conservation Ordinance) (No. 12 of 1983) were found on site.

Seven Declared Weeds and Invader species were observed on the study site, namely; *Agave sisalana, Cirsium vulgare, Xanthium strumarium, Eucalyptus cf. camaldulensis, Nasturtium officinale, Solanum sisymbriifolium* and *Verbena bonariensis.*

No untransformed vegetation communities were identified within the study area. Transformed, semi-transformed and fragmented areas make up 100% or approximately 32.41 ha, of the study area. Three broad-scale habitat types representing natural degraded grassland, rocky grassland and a depression wetland are present on site. The rocky grassland broad-scale habitat type is located within the Happiness Primary School yard outside of the development site therefore it will not be addressed in this report.

- Degraded Soweto Highveld Grassland

This vegetation association is located along the study site perimeter, and represents a degraded terrestrial grassland confined to an area of approximately 7.2 ha in total (22.22 %). The floristic structure can be described as being short and human-modified as evidenced by the persistent grazing by livestock (goats, cattle and horses) and widespread soil disturbances (e.g. dumping and diggings), thereby altering the grassland structure to form distinctive "lawns". The floristic composition is dominated by secondary graminoids and forbs species, with a high proportion of ruderal and annual alien weed species.

Dominant grass species include *Cynodon dactylon* and the alien species *Pennisetum clandestinum*, although other noteworthy grass species include *Eragrostis curvula*, *E. chloromelas, Hyparrhenia hirta, Aristida congesta* and *Pogonarthria squarrosa*. Noteworthy forb species include primarily alien and declared invader species such as *Xanthium strumarium*, *Solanum sisymbriifolium*, *Zinnia peruviana, Gomphrena celosioides, Tagetes minuta, Verbena bonariensis, Plantago lanceolata, Guilleminea densa, Alternanthera pungens, Cirsium vulgare, Conyza albida, Hypochoeris radicata* and *Verbena aristigera*. Typical secondary indigenous forb species include S*eriphium plumosum, Pseudognaphalium luteo-album, Felicia muricata* and *Gomphocarpus fruticosus,*

This species composition is representative of transformed Soweto Highveld Grassland (Mucina & Rutherford, 2006). Species richness was low with a total of 32 species recorded (47 % of the total richness on the study site).

This grassland unit is considered to be of low ecological sensitivity for the following reasons:

- It is representative of transformed and degraded Soweto Highveld Grassland.
- Floristic richness is low and a high proportion of the species composition consists of alien and ruderal weed species.
- The probability for plant species of conservation concern to occur is low.

- Depression Wetland

This vegetation association is confined to a large depression wetland on the central part of the study site. It represents two discrete vegetation sub-units confined to a marginal zone and an inundation zone. The former is seasonally inundated during the austral wet season, while the latter is confined to an area of perennial inundation. The association covers a large section of 13.11 ha, which equates to 40.44 % of the entire study site.

The marginal zone consists of a small floristic area along the outer edge of the wetland system, which is dominated by *Pennisetum clandestinum* and *Trifolium repens*. Other noteworthy grass species include

Themeda triandra, Sporobolus africanus, Andropogon eucomus, Imperata cylindrica and *Eragrostis micrantha*. Noteworthy forb species include *Helichrysum aeronitens, Seriphium plumosum, Hypochoeris radicata* and *Juncus oxycarpus*.

The permanent inundation zone is dominated by *Leersia hexandra, Juncus effuses* and *Typha capensis*. Other noteworthy graminoid species include *Phragmites australis, Hemarthria altissima, Paspalum dilatatum* and *P. urvillei*. Other noteworthy plant species include many members of the Juncaceae and Cyperaceae, including *Juncus oxycarpus, J. exsertus, J. dregeanus, Cyperus denudatus, C. fastigiatus, C. laevigatus, Schoenoplectus corymbosus, Nasturtium officinale, Ludwigia adscendens, Centella asiatica, Plantago major* and *Rumex crispus*.

Species richness was high with a total of 51 species recorded in the depression wetland (76 % of the total richness on the study site).

This unit is considered to be of high ecological sensitivity for the following reasons:

- It represents a wetland system with a high proportion of obligate and facultative wetland plant species.
- The floristic structure, flooded grassland and open water provide habitat for a high richness of water bird and wading bird species, with the potential for two near threatened and one vulnerable bird species to occur.

Fauna

The study site is surrounded by residential development with limited ecological connectivity with natural systems which occur in the immediate surroundings. This limitation will affect the dispersal ability of terrestrial mobile fauna (apart from birds), thereby constraining the colonisation or emigration of fauna to and from the study site. In addition, the presence of human activities on the study site is high, which will deter large-bodied and even medium-bodied fauna (in particular mammal species) taxa from utilising the site. Such taxa are likely to be hunted or displaced by feral and domestic dogs and cats, including grazing disturbances caused by livestock. Therefore, the fauna richness is expected to be low, and will consist mainly of very widespread taxa and generalists.

- Mammals

Due to the high transformation of natural habitat, the occurrence of human activities and limited ecological connectivity on the study site, the probability for any large-bodied threatened of near threatened mammal species to occur is low. Only two near threatened species could occur on the study site, namely the Swamp Mush Shrew (*Crocidura mariquensis*) and the Vlei rat (*Otomys auratus*). Both these species could associate with the seasonally flooded and moist grassland of the marginal zone (along the depression wetland). However, even the predicted occurrence of these two species are regarded to be low-medium due to disturbances and habitat modifications caused by grazing livestock.

The depression wetland also provides potential foraging habitat for the near threatened Cape Clawless Otter (*Aonyx capensis*). However, when considering the high frequency human activities and feral animals (e.g. dogs), the occurrence of *A. capensis* on the study site is regarded as irregular and occasional. In addition, signs pertaining to the presence of this species such as latrines, scats and spoor along the depression wetland was searched for during the site visit but was not encountered, thereby rendering the presence of this species on the study site as low, although it has been recorded within QDS 2628BC (*c*. 17 records in total, *sensu* MammaMap).

The only species that are abundant on the study site are widespread and generalist taxa such as the African Savanna Hare (*Lepus victoriae*), Multimammate Mouse (*Mastomys cf. coucha*), Four-striped Grass Mouse (*Rhabdomys pumilio*) and the Highveld Mole-rat (*Cryptomys pretoriae*).

- Birds

Of the potentially occurring bird species, one near threatened bird species was confirmed from pentad grid 2625_2830, while another threatened and two near threatened species could occur as irregular foraging visitors to the depression wetland during optimal conditions (e.g. presence of preferred food, water levels, etc.):

  - Red-footed Falcon *Falco vespertinus* (Near Threatened; IUCN, 2019) – The most recent observation of this species in the study region was during 2015. It is regarded as an uncommon foraging visitor during summer where it often cooccurs with Amur Falcons (*Falco amurensis*). This species is unlikely to be adversely affected by the proposed development.
  - Greater Flamingo *Phoenicopterus roseus* (Near threatened; Taylor *et al*., 2015) – This species is regarded as an irregular foraging visitor to the depression wetland. According to the SABAP2 database, *P. roseus* has not been recorded in the pentad grid corresponding to the study area. However, it is often highly nomadic, and individuals of this species may utilise the depression wetland during optimal conditions (e.g. presence of suitable prey). Even though it could occur, observations are regarded as erratic.
  - Lesser Flamingo *Phoeniconaias minor* (Near threatened; IUCN, 2019) – This species is regarded as an irregular foraging visitor to the depression wetland. According to the SABAP2 database, *P. minor* has not been recorded in the pentad grid corresponding to the study area. However, it is often highly nomadic, and individuals of this species may utilise the depression wetland during optimal conditions (e.g. presence of suitable prey). Even though it could occur, observations are regarded as erratic.
  - Maccoa Duck *Oxyura maccoa* (Vulnerable; IUCN, 2019) – This species is regarded as an irregular foraging visitor to the depression wetland. According to the SABAP2 database, *O. maccoa* has not been recorded in the pentad grid corresponding to the study area. However, it is nomadic, and post-breeding individuals may on occasion utilise the depression wetland. Even though it could occur, observations are regarded as erratic.

- Amphibians and Reptiles

The only frog species of "conservation concern" that could potentially occur in the area is the near threatened Giant Bullfrog (*Pyxicephalus adspersus*). It is unknown whether this species will utilise the depression wetland for breeding purposes, although given the low reporting rate (only a single historical observation) for this species in the region - it is of the opinion to be rare or uncommon in the area. Please note that *P. adspersus* is no longer considered by GDARD to be a provincial conservation entity (GDARD, 2017).

There are no threatened or near threatened reptile species expected to be present on the study site.

Specialist Recommendations

More than 50 % (c. 56.4 %) of the study site consists of degraded and/ or transformed habitat units. Of the transformed and degraded habitat units, approximately 11.08 ha (c. 34.18 %) consist of infrastructure and recreational facilities such as sport fields. The remaining habitat consists of degraded grassland of 7.2 ha (22.22 %) which provides habitat for widespread generalists and eurytopic species. The degraded grassland unit was also subjected to poor grassland management regimes and intense grazing, while some areas

show signs of soil disturbances and the disposal of rubble. These areas (degraded grassland and infrastructure) support low levels of biodiversity and the proposed rehabilitation of the study site have the potential to enhance the local biodiversity and ecological function in the area. The central section of the study site consists of a large depression wetland (c. 13.1 ha), and although already impacted by domestic waste and litter, it also receives effluent of poor water quality from nearby stormwater and faulty sewer reticulation systems. However, the depression wetland system is utilised by a number of water bird species and provide potential habitat for two near threatened small mammal species and three bird species of conservation concern.

It is of the opinion that the rehabilitation initiative could enhance the local biodiversity of the study site, especially the terrestrial and degraded grassland units bordering the central depression wetland.

Refer to Appendix D.3 for the full Ecology report.

4. SURFACE WATER AND HYDROLOGY

A specialist wetland survey was undertaken by Imperata Consulting to conduct a baseline wetland delineation study and delineate wetlands and riparian area, as well as, determine the present ecological state (PES) and the ecological importance and sensitivity (EIS).

The site is located in Quaternary Catchment C21E, within the Upper Vaal Water Management Area (WMA). Quaternary Catchment C21E has a largely modified (class D) Present Ecological State (PES) and a High Ecological Importance and Sensitivity (EIS), (Middleton and Bailey, 2008). The Blesbokspruit River is located approximately 0.85 km west of the site. All existing wetland associated spatial datasets indicate the presence of wetland habitat, within the study area. These include the NFEPA (2011), NBA (2018), 2013-2014 Landcover dataset (GTI, 2015).

The entire site is dominated by a depression hydro-geomorphic (HGM) wetland unit that has been modified by infilling, dumping, alien plants, stormwater inflows and infrastructure, specifically sport fields and hard surface structures. A second wetland is located southwest of the site, but falls within a separate catchment. Depression wetlands are endorheic wetland types that drain inward and are therefore not connected to the rest of the drainage network. The second wetland is a channelled valley bottom wetland with a prominent storm water drain in its centre.

The depression wetland has a size of 27.4 ha and overlap with 84.82 % of the 32.3 ha site, while the channelled valley bottom has a size of 3.1 ha and does not overlap with the site. Since the channelled valley bottom wetland is located outside of the development site it will not be addressed in this report.

The large central zone of the site, referred to as the core wetland zone, is characterised by permanent to seasonal wetland conditions. Standing water is present during winter and increases in size during summer. Recorded obligate hydrophytes include the rush *Typha capensis*, the sedges *Juncus effuses*, *J. oxycarpus*, *J. exsertus*, *J. dregeanus*, *Cyperus denudatus*, *C. fastigiatus*, *C. laevigatus*, *Schoenoplectus corymbosus* and the grasses *Phragmites australis, Leersia hexandra, Hemarthria altissima, Paspalum dilatatum* and *P. urvillei*.

Indicators in the outer margins of the wetland were obscured by soil disturbances, but hydromorphic features, such as mottling and spots of localised iron depletion, were still recorded in-between disturbances throughout the study area. The school property, located within the north-western portion of the site was not surveyed as the proposed Open Space Development Plan does not currently include this area.

Depression wetland

Five different zones are present within the depression wetland. These zones were identified based on a combination of factors that include wetness regime, land use and type of disturbance. Each zone has a similar level of disturbance and are used to help determine the PES of the depression wetland. The school property wetland zone primarily indicates an area that was not surveyed and also partially burned in August 2019. The school property wetland zone has a surface area of 1.11 ha and overlaps with 4.03 % of the depression wetland. The margins of the depression wetland are clearly more disturbed than the central core area. The core wetland zone has a surface area of 12.84 ha and forms 46.83 % of the depression wetland.

- Infrastructure encroachment, specifically the present of sport fields that have been raised above the natural ground level, as well as hard surface development, such as tennis courts and a pavilion. The infrastructure wetland zone has a combined surface area of 6.51 ha and forms 23.75 % of the depression wetland.
- Infill forms a raised semicircle within a portion of the depression wetland with temporary structures, such as an informal car wash along Sastri Road. Infill also encroaches into the centre of the core area as an old dam wall. The infill wetland zone has a combined surface area of 3.09 ha and forms 11.28 % of the depression wetland.
- A disturbed outer zone where localised dumping and dense stands of alien plant species are present, specifically the grass *Pennisetum clandestinum* (kikuyu). A high grazing pressure by cattle and a tied horse is also present in this zone. The disturbed outer wetland zone has a combined surface area of 3.86 ha and forms 14.07 % of the depression wetland.

Localised dumping extends into the core area; the area contains permanent inundation that fluctuates depending on rainfall. The entire catchment of the depression wetland consists of a built-up area that drains into the wetland. Stormwater inflows into the wetland occurs at different outlets. One such stormwater inlet in the east, next to Ahzed Avenue, has been converted into a stormwater channel. It contained a distinct smell of sewage pollution, as well as visible evidence of sewage pollution. Low water quality inflows into the wetland is therefore regarded as a common occurrence.

The combined Present Ecological State (PES) of the depression wetland is a class E (Seriously modified) based on an assessment of identified impacts. The Seriously modified state of the wetland has a high level of confidence associated with it.

Ecological Importance and Sensitivity (EIS) assessments do not compare a wetland to its reference condition, but to the provision of ecosystem services, which include their value to biodiversity, hydrological functioning and direct human benefits. This includes the provision of grazing habitat and other natural resources.

The EIS of the wetland is regarded as Moderate (class C). This is mainly due to overlap with a Critically Endangered Threatened Ecosystem, namely the Blesbokspruit Highveld Grassland (GP1). No “species of conservation concern” were recorded within the depression wetland. The level of confidence associated with the occurrence of ‘species of conservation concern” is low, as the site survey was undertaken during the dry season. The wetland is, however, seriously modified (class E PES) and natural habitat is disturbed by different impacts throughout the study area. The ecological investigation also regards the likelihood for the occurrence of wetland-associated plant ‘species of conservation concern” as Low (Niemand, 2019).

The Hydro-functional Importance and Direct Human Benefits categories are respectively calculated as Low/Marginal (class D) and None (Class E). Depression wetlands provide minimum hydrological

ecosystem services as they are endorheic systems that are not connected to the drainage network. The only distinct direct human benefit is the provision of grazing habitat for cattle.

Specialist Recommendations

The proposed open space plan development is not expected to cause further degradation of the wetland even though the activities are located within wetland habitat. The affected depression wetland is Severely modified (class E PES) and will remain in this PES class in spite of the proposed development on the condition that indigenous species are used for the proposed open space development and that alien control is applied. An opportunity is therefore available to improve wetland habitat through the removal, or partial removal, of existing infill material and the control of alien plant species.

The proposed development is not associated with a fatal flaw from a wetland health and functioning consideration. However, all of the identified project-related impacts associated with section 21 (c) and (i) water uses during the Construction and Operational Phase of the proposed development cannot be reduced to a Low risk class with mitigation. This is mainly due to the methodology applied in the GN 509 risk matrix impact assessment protocol, which results in an automatic High severity for any development activity located within wetland habitat. A full WULA will therefore be required to obtain authorisation for Section 21 (c) and (i) water use activities based on results from the GN 509 risk matrix assessment (Table 15).

Refer to Appendix D.1 for the full Wetland Report.

5. CULTURAL/HISTORICAL FEATURES

Francois P. Coetzee, an independent Cultural Heritage Consultant, was commissioned by NuLeaf Planning and Environmental to undertake a Heritage Impact Assessment on the Farm Bultfontein 192 IR in Nigel, Ekurhuleni Metropolitan Municipality, Gauteng in order to determine the heritage potential and the impact on possible heritage resources.

No archaeological (Stone Age and Iron Age) or historical settlements, structures, features, assemblages or artefacts were recorded during the survey.

Also, please note:
Archaeological deposits usually occur below ground level. Should archaeological artefacts or skeletal material be revealed in the area during development activities, such activities should be halted, and a university or museum notified in order for an investigation and evaluation of the find(s) to take place (cf. NHRA (Act No. 25 of 1999), Section 36 (6)).

Refer to Appendix D.2 for the full Heritage Impact Report.

6. SOCIO-ECONOMIC CHARACTER

In 2015 the City of Ekurhuleni had a population of 3.38 million people, which is 6.2% of South Africa's total population, it saw on average a growth rate of 2.39% between 2005 and 2015 – which is large when compared to South Africa as a whole (1.51%). This can be attributed to the migration phenomenon, as people move from other parts of the country seeking employment; particularly the youth. There is a greater propensity for people to migrate to the City of Ekurhuleni, as it is considered an economic hub, one of the first choices of destination by job seekers across the country and region. Given the most current fertility, mortality and migration rates it is projected that Ekurhuleni's population will grow at an annual rate of 1.8% and will therefore have an impact on the spatial plans of the municipality as well as the delivery of basic services and job availability.

An increase in the population of an area will lead to an increase in the demand for jobs within that area. Overall, unemployment in the City of Ekurhuleni is around 25% with youth unemployment predicted at 35%. Four sectors dominate the City of Ekurhuleni's economy. They are; the manufacturing sector, the finance and business sector, the community sector and the general government sector. A major shift has been seen between the manufacturing sector which declined from 30.3% in 2000 to 22.7% in 2015 while the finance and business sector saw an increase from 14.8% in 2011 to 21.3% in 2015. The City of Ekurhuleni, together with South Africa in general, is seeing a steady increase in the unemployment rate which is a concern to the country and all municipalities. Unemployment brings with it many negative impacts to a community including being the major cause of poverty.

Over the next few years the City aims to reduce poverty, inequality and unemployment using a structured and systematic manner. The City further strives to provide opportunities that share cultural experiences, as well as the promotion of distinctive areas where communities can express themselves authentically, one way it plans to do this is by developing public spaces for social cohesion.

SECTION C: PUBLIC PARTICIPATION

1. ADVERTISEMENT AND NOTICE

An advertisement was placed in the Heidelberg/Nigel Heraut, a local publication, on 7 August 2019. Pamphlets were handed out to all the surrounding properties on the 23 August 2019. Six site notices were placed at the following strategic locations in and around the proposed property on 6 August 2019:

Site Notice Position	Latitude	Longitude
Poster Position 1	26° 26' 43.35" S	28° 30' 54.21" E
Poster Position 2	26° 26' 40.38" S	28° 30' 56.16" E
Poster Position 3	26° 26' 31.52" S	28° 30' 54.36" E
Poster Position 4	26° 26' 21.42" S	28° 30' 49.98" E
Poster Position 5	26° 26' 26.56" S	28° 30' 49.70" E
Poster Position 6	26° 26' 26.74" S	28° 30' 37.61" E

2. DETERMINATION OF APPROPRIATE MEASURES

The following details the measures taken to include all potential I&APs as required by Regulation 41(2)(e) and 41(6) of GN 733:

- A list of interested and affected parties (I&AP's), as well as, compliance authorities was compiled inclusive of Local and District Municipalities, local landowners and environmental organizations.
- Written notification of the proposed development, including a background information document, was sent to all identified I&AP's and Compliance Authorities on 14 August 2019.
- A printed advertisement was placed in the Heidelberg/Nigel Heraut, a local publication, on the 7 August 2019.
- Six site notices were placed around the affected property, on 6 August 2019.

The following key stakeholders (other than organs of state) identified in terms of Regulation 41(2)(b) of GN 733 were notified:

Name	Affiliation
Peter Law	WESSA: Springs and Nigel
Wollaston Labuschagne	Ward 88 Councillor
Solomon Thebe	Community Member
Happiness Primary School	Neighbouring Property
Nigel Secondary School	Neighbouring Property
Andrew Mitchell	Community Member
Wilna De Fortier	Community Member

Proof of stakeholder engagement is included in Appendix E.2.

3. ISSUES RAISED BY INTERESTED AND AFFECTED PARTIES

Interested and Affected Party	Issue
None to date.	None to date.

4. COMMENTS AND RESPONSE REPORT

Please refer to Appendix E.3 for the comments and response report.

5. AUTHORITY PARTICIPATION

Authorities and organs of state identified as key stakeholders:

Authority/ Organ of State	Contact Person
Lilian Siwelane	DWS: Manager
Tshepo Mathebe	DWS: Catchment Officer
John Dinin	DEA: Working for Wetlands
Jan Micthell	Eskom

Refer to Appendix E.4 for proof that the Authorities and Organs of State received written notification of the proposed activities.

6. CONSULTATION WITH OTHER STAKEHOLDERS

Refer to Appendix E.5 for a list of registered I&APs.

SECTION D: IMPACT ASSESSMENT

1. IMPACTS THAT MAY RESULT FROM THE PLANNING AND DESIGN, CONSTRUCTION, OPERATIONAL, DECOMMISSIONING AND CLOSURE PHASES AS WELL AS PROPOSED MANAGEMENT OF IDENTIFIED IMPACTS AND PROPOSED MITIGATION MEASURES

Activity	Impact summary	Significance	Proposed mitigation
Only Alternative			
Planning and Design Phase	*Direct impacts:*		
	Ground Water		
	Loss of groundwater recharge due to the introduction of impermeable hard surfaces.	14 L	• Planning and compliance, including protected species, heritage, storm water management and waste management as per the EMPr (section 7.2). • Development footprint planning as per the EMPr (section 7.2).
	Hydrology (Surface Water)		
	Loss of ecological and hydrological function of the wetland	20 L	• Planning and compliance, including ground water, surface water and storm water management as per the EMPr (section 7.1). • Development footprint planning as per the EMPr (section 7.2).
	Soil		
	Erosion risk to soils	20 L	• Planning and compliance, including ground water, surface water, storm water management and waste management as per the EMPr (section 7.1). • Development footprint planning as per the EMPr (section 7.2).
	Air		
	None.		
	Biodiversity (Flora)		
	Risk to Soweto Highveld Grassland vegetation classified as Threatened	24 L	• Planning and compliance, including protected species, storm water management and waste management as per the EMPr (section 7.1). • Development footprint planning as per the EMPr (section 7.2).
	Risk to sensitive habitats	8 N	
	Risk to plant species of conservation importance	8 N	
	Biodiversity (Fauna)		
	Risk to grassland and wetland faunal habitat	14 L	• Planning and compliance, including protected species, storm water management and waste management as per the EMPr (section 7.1). • Development footprint planning as per the EMPr (section 7.2).
	Land use and Agricultural potential		
	Loss of potentially arable land due to site clearing and placement of infrastructure.	7 N	• Development footprint planning as per the EMPr section 7.2).
	Heritage		
	None.		
	Visual		
	Risk of visual impact on sensitive visual receptors in close proximity (Positive impact)	*85* *H*	• Development footprint planning as per the EMPr (section 7.2). • Visual environment planning as per the EMPR (section 7.3).
	Socio-economic		

Activity	Impact summary	Significance	Proposed mitigation
	Risk to projects integrity due to lack of community involvement and buy in to ensure maximum benefit.	39 M	• Socio-economic planning as per the EMPr (section 7.4).
	Municipal services and Traffic		
	Risk to project integrity due to renewed / ongoing dumping and sewage spills.	40 M	• Planning and compliance, including protected species, heritage, storm water management and waste management as per the EMPr (section 7.1). • Socio-economic planning as per the EMPr (section 7.4).
	Indirect impacts:		
	None.		
	Cumulative impacts:		
	Hydrology (Surface Water)		
	Cumulative loss of ecological and hydrological function of the wetland	22 L	• Planning and compliance, including protected species, storm water management and waste management as per the EMPr (section 7.1). • Development footprint planning as per the EMPr (section 7.2).
Construction Phase	*Direct impacts:*		
	Ground Water		
	Pollution and contamination of ground water	12 N	• Pre-construction planning, including planning and preparation as per the EMPr (section 8.1) • Site establishment, including site demarcation, accommodation, pollution control and access roads as per the EMPr (section 8.2) • Materials management, including solid, liquid and hazardous waste, concrete and cement work, fuel and hazardous material as per the EMPr (section 8.3). • Vehicles and equipment management as per the EMPr (section 8.7).
	Hydrology (Surface Water)		
	Disturbance and loss of ecological function of the wetland	27 L	• Pre-construction planning, including planning and preparation as per the EMPr (section 8.1) • Site establishment, including site demarcation, accommodation, pollution control, access roads and protection of the riparian system as per the EMPr (section 8.2) • Materials management, including solid, liquid and hazardous waste, concrete and cement work, fuel and hazardous material as per the EMPr (section 8.3). • Stockpiles, storage and handling as per the EMPr (section 8.4). • Erosion control, including water management, storm water management, excavation, backfilling and trenching as per the EMPr (section 8.5). • Alien plant control as per the EMPr (section 8.6). • Vehicles and equipment management as per the EMPr (section 8.7). • Socio-economic management, including
	Pollution and contamination of surface water	27 L	

Activity	Impact summary	Significance	Proposed mitigation
			staff, visual as per the EMPr (section 8.8). • Fire management as per the EMPr (section 8.9). • Rehabilitation as per the EMPr (section 8.10).
	Soil		
	Soil contamination and pollution	24 L	• Pre-construction planning, including planning and preparation as per the EMPr (section 8.1) • Site establishment, including site demarcation, accommodation, pollution control and access roads as per the EMPr (section 8.2) • Materials management, including solid, liquid and hazardous waste, concrete and cement work, fuel and hazardous material as per the EMPr (section 8.3). • Stockpiles, storage and handling as per the EMPr (section 8.4). • Erosion control, including water management, storm water management, excavation, backfilling and trenching as per the EMPr (section 8.5). • Vehicles and equipment management as per the EMPr (section 8.7). • Rehabilitation as per the EMPr (section 8.10).
	Soil erosion by wind and rain	16 L	
	Air		
	Air pollution due emissions from construction vehicles and equipment.	24 L	• Site establishment, including site demarcation, accommodation, pollution control and access roads as per the EMPr (section 8.2) • Stockpiles, storage and handling as per the EMPr (section 8.4). • Erosion control, including water management, storm water management, excavation, backfilling and trenching as per the EMPr (section 8.5). • Vehicles and equipment management as per the EMPr (section 8.7). • Socio-economic management, including visual as per the EMPr (section 8.8). • Fire management as per the EMPr (section 8.9). • Rehabilitation as per the EMPr (section 8.10).
	Dust liberated by general construction activities and movement of construction vehicles.	24 L	
	Smoke from open fires used by site staff for heating and cooking as well as from uncontrolled fires	12 N	
	Biodiversity (Flora)		
	Removal of invader alien species found on site ***(Positive impact)***	*45* *M*	• Pre-construction planning, including planning and preparation as per the EMPr (section 8.1) • Site establishment, including site demarcation, accommodation, pollution control, access roads, protection of flora, and protection of the riparian system as per the EMPr (section 8.2) • Materials management, including solid, liquid and hazardous waste, concrete and cement work, fuel and hazardous material as per the EMPr (section 8.3).
	Loss of Soweto Highveld Grassland vegetation classified as Threatened	30 L	
	Disturbance of sensitive habitats	21 L	
	Increase in exotic vegetation/alien species and bush encroachment into disturbed soils and areas	14 L	

Activity	Impact summary	Significance	Proposed mitigation
			• Stockpiles, storage and handling as per the EMPr (section 8.4). • Erosion control, including water management, storm water management, excavation, backfilling and trenching as per the EMPr (section 8.5). • Alien plant control as per the EMPr (section 8.6). • Vehicles and equipment management as per the EMPr (section 8.7). • Fire management as per the EMPr (section 8.9). • Rehabilitation as per the EMPr (section 8.10).
	Biodiversity (Fauna)		
	Loss of faunal habitat	12 N	• Pre-construction planning, including planning and preparation as per the EMPr (section 8.1) • Site establishment, including site demarcation, accommodation, pollution control, access roads, protection of flora and protection of fauna as per the EMPr (section 8.2) • Materials management, including solid, liquid and hazardous waste, concrete and cement work, fuel and hazardous material as per the EMPr (section 8.3). • Erosion control, including excavation, backfilling and trenching as per the EMPr (section 8.5). • Alien plant control as per the EMPr (section 8.6). • Vehicles and equipment management as per the EMPr (section 8.7). • Socio-economic management, including staff as per the EMPr (section 8.8). • Fire management as per the EMPr (section 8.9). • Rehabilitation as per the EMPr (section 8.10).
	Faunal disturbances and temporary changes in the distribution and abundance	18 L	
	Mortality of fauna	18 L	
	Land use and Agricultural potential		
	None.		
	Heritage		
	None.		
	Visual		
	The potential visual impact of construction, lighting and dust on sensitive visual receptors in close proximity to the site.	30 L	• Pre-construction planning, including planning and preparation as per the EMPr (section 8.1) • Site establishment, including site demarcation, accommodation, pollution control and access roads as per the EMPr (section 8.2) • Materials management, including solid, liquid and hazardous waste, concrete and cement work, fuel and hazardous material as per the EMPr (section 8.3). • Stockpiles, storage and handling as per the EMPr (section 8.4). • Erosion control, including water

Activity	Impact summary	Significance	Proposed mitigation
			management, storm water management, excavation, backfilling and trenching as per the EMPr (section 8.5). • Vehicles and equipment management as per the EMPr (section 8.7). • Socio-economic management, including staff, visual as per the EMPr (section 8.8). • Fire management as per the EMPr (section 8.9). • Rehabilitation as per the EMPr (section 8.10).
	Socio-economic		
	Stimulation of the local economy, especially the local service delivery industry *(Positive Impact)*	*32* *M*	• Socio-economic planning as per the EMPR (section 7.4). • Pre-construction planning, including planning and preparation as per the EMPr (section 8.1) • Site establishment, including accommodation and access roads as per the EMPr (section 8.2) • Vehicles and equipment management as per the EMPr (section 8.7). • Socio-economic management, including staff as per the EMPr (section 8.8). • Fire management as per the EMPr (section 8.9).
	Creation of short-term employment and business opportunities and the opportunity for skills development and on-site training. *(Positive impact)*	*40* *M*	
	Noise, dust and safety impacts and disturbance to visiting tourists and guests due to general construction activities and movement of construction vehicles.	30 L	
	An increase in construction workers and associated increase in social problems for the community	16 L	
	Increased risk of veld fires due to the presence of construction workers on site.	16 L	
	Municipal services and Traffic		
	Increase in traffic on the surrounding roads due to construction vehicles	24 L	• Pre-construction planning, including planning and preparation as per the EMPr (section 8.1) • Site establishment, including access roads as per the EMPr (section 8.2) • Vehicles and equipment management as per the EMPr (section 8.7). • Socio-economic management, including visual as per the EMPr (section 8.8).
	Indirect impacts:		
	Biodiversity (Flora)		
	None.		
	Socio-economics		
	None.		
	Traffic and services		
	Degradation of local roads due to the increase in the numbers of heavy vehicles.	24 L	• As above
	Cumulative impacts:		
	Biodiversity (Flora)		
	Cumulative loss of Soweto Highveld Grassland vegetation classified as Threatened	20 L	• Pre-construction planning, including planning and preparation as per the EMPr (section 8.1) • Site establishment, including site demarcation, accommodation, pollution control, access roads, protection of flora,
	Cumulative loss of ecological function of sensitive habitats.	20 L	

Activity	Impact summary	Significance	Proposed mitigation
			and protection of the riparian system as per the EMPr (section 8.2) • Materials management, including solid, liquid and hazardous waste, concrete and cement work, fuel and hazardous material as per the EMPr (section 8.3). • Stockpiles, storage and handling as per the EMPr (section 8.4). • Erosion control, including water management, storm water management, excavation, backfilling and trenching as per the EMPr (section 8.5). • Alien plant control as per the EMPr (section 8.6). • Vehicles and equipment management as per the EMPr (section 8.7). • Fire management as per the EMPr (section 8.9). • Rehabilitation as per the EMPr (section 8.10).
	Socio-economics		
	Community upliftment and the opportunity to up-grade and improve skills levels in the area (Positive impact)	*21* *L*	• Socio-economic planning as per the EMPR (section 7.4). • Pre-construction planning, including planning and preparation as per the EMPr (section 8.1) • Site establishment, including accommodation and access roads as per the EMPr (section 8.2) • Vehicles and equipment management as per the EMPr (section 8.7). • Socio-economic management, including staff as per the EMPr (section 8.8). • Fire management as per the EMPr (section 8.9).
	Municipal services & traffic		
	Cumulative increase in the number and frequency of vehicles (construction vehicles) and the resultant noise, dust, and safety impacts for other road users and the residents of the local communities.	24 L	• Pre-construction planning, including planning and preparation as per the EMPr (section 8.1) • Site establishment, including access roads as per the EMPr (section 8.2) • Vehicles and equipment management as per the EMPr (section 8.7). • Socio-economic management, including visual as per the EMPr (section 8.8).
Operational Phase	*Direct impacts:*		
	Ground Water		
	Improved ground water quality (Positive impact)	*56* *M*	• Biodiversity management, including access roads and resource management as per the EMPr (section 9.1) • Materials management, including solid liquid and hazardous waste, fuel and hazardous material as per the EMPr (section 9.2) • Erosion control as per the EMPr (section 9.3) • Socio economic management, including staff management as per the EMPR (section 9.5)

Activity	Impact summary	Significance	Proposed mitigation
			• Vehicles and equipment management as per the EMPr (section 9.4)
	Hydrology (Surface Water)		
	Improved flow / hydrological and ecological function of the wetland (Positive impact)	39 M	• Biodiversity management, including access roads, resource management, protection of flora and alien plant control as per the EMPr (section 9.1) • Materials management, including solid, liquid and hazardous waste, fuel and hazardous material as per the EMPR (section 9.2) • Erosion control as per the EMPr (section 9.3) • Vehicles and equipment management as per the EMPr (section 9.4) • Socio economic management, including staff management as per the EMPR (section 9.5) • Fire management as per the EMPR (section 9.6)
	Improved water quality within the wetland (Positive impact)	56 M	
	Soil		
	Stabilisation of area and decrease the risk of erosion. (Positive impact)	52 M	• Biodiversity management, including access roads, resource management, protection of flora and alien plant control as per the EMPr (section 9.1) • Materials management, including solid liquid and hazardous waste, fuel and hazardous material as per the EMPR (section 9.2) • Erosion control as per the EMPr (section 9.3) • Vehicles and equipment management as per the EMPr (section 9.4) • Socio economic management, including staff management as per the EMPR (section 9.5)
	Soil erosion	14 L	
	Air		
	None.		
	Biodiversity (Flora)		
	Protection of Soweto Highveld Grassland vegetation classified as Threatened (Positive impact)	*52 M*	• Biodiversity management, including access roads, resource management, protection of flora and alien plant control as per the EMPr (section 9.1) • Materials management, including solid liquid and hazardous waste, fuel and hazardous material as per the EMPR (section 9.2) • Erosion control as per the EMPr (section 9.3) • Vehicles and equipment management as per the EMPr (section 9.4) • Socio economic management, including staff management as per the EMPR (section 9.5) • Fire management as per the EMPR (section 9.6)
	Protection of sensitive environments (Positive impact)	*52 M*	
	Colonisation and re-emergence of exotic vegetation / alien species and bush encroachment into disturbed soils and poorly rehabilitated areas.	22 L	
	Biodiversity (Fauna)		
	Creation and improvement of faunal habitat	52 M	• Biodiversity management, including

Activity	Impact summary	Significance	Proposed mitigation
	Faunal disturbances, displacement of taxa and changes in distribution and abundance	18 L	access roads, resource management, protection of flora, alien plant control and protection of fauna as per the EMPr (section 9.1) • Materials management, including solid liquid and hazardous waste, fuel and hazardous material as per the EMPR (section 9.2) • Erosion control as per the EMPr (section 9.3) • Vehicles and equipment management as per the EMPr (section 9.4) • Socio economic management, including staff management, and visual impact management as per the EMPR (section 9.5) • Fire management as per the EMPr (section 9.6)
	Mortality of fauna	16 L	
	Land use and Agricultural potential		
	None.		
	Heritage		
	None.		
	Visual		
	Potential visual impact on visual receptors in close proximity. ***(Positive impact)***	*48* *M*	• Socio economic management, including staff management and visual impact management as per the EMPr (section 9.5)
	Impact on the character of the landscape and sense of place of the neighbourhood. ***(Positive impact)***	*70* *H*	
	Visual impact of lighting on visual receptors in close proximity to the site owing to the lighting of the park.	*24* *L*	
	Socio-economic		
	Creation of long term employment and business opportunities as well as opportunities for skills development and transfer ***(Positive impact)***	*60* *H*	• Socio economic management, including staff management, and visual impact management as per the EMPr (section 9.5)
	The provision of formalized community park in accessible area. ***(Positive impact)***	*52* *M*	
	Risk to long term integrity of open space due to continued dumping.	*24* *L*	
	Threat to rehabilitated system due to ongoing sewage spillage and overflow (i.e. poor municipal infrastructure).	*24* *L*	
	Potential impact of noise and disturbance of people in close proximity to community park.	20 L	
	Municipal services and traffic		
	Operational cost of running services and infrastructure.	36 M	• Socio economic management, including staff management and visual impact management as per the EMPR (section 9.5)
	Indirect impacts:		
	Visual		

Activity	Impact summary	Significance	Proposed mitigation
	Potential visual impact on the visual character of the landscape and sense of place of the neighbourhood. ***(Positive impact)***	*70 H*	• Socio economic management, including staff management and visual impact management as per the EMPR (section 9.5)
	Cumulative impacts:		
	Hydrology (Surface water)		
	Improved water quality throughout the catchment ***(Positive impact)***	*60 H*	• Resource management, including access roads and resource management as per the EMPr (section 9.1) • Materials management, including solid liquid and hazardous waste, fuel and hazardous material as per the EMPr (section 9.2) • Erosion control as per the EMPr (section 9.3) • Vehicles and equipment management as per the EMPr (section 9.4) • Socio economic management, including staff management as per the EMPr (section 9.5) • Waste management plan as per the EMPr (section 10.3)
	Visual		
	The accumulation of formalized parkland and high quality open space within the local area. ***(Positive impact)***	*52 H*	• Socio economic management, including staff management and visual impact management as per the EMPr (section 9.5) • Waste management plan as per the EMPr (section 10.3)
	Socio-economics		
	Social and community upliftment owing to access to open space ***(Positive impact)***	*60 H*	• Socio economic management, including staff management and visual impact management as per the EMPr (section 9.5)

Please refer to Appendix F for the full impact assessment.

2. ENVIRONMENTAL IMPACT STATEMENT

The proposed development falls within the Soweto Highveld Grassland vegetation type, classified as Threatened. Untransformed Soweto Highveld Grassland is a threatened ecosystem that is locally known as Blesbokspruit Highveld Grassland, which is a critically endangered ecosystem, however, Blesbokspruit Highveld Grassland patches on the study site are severely transformed by anthropogenic activities and no longer represent an untransformed (primary) grassland composition. A small portion of the study is also characterised as a Critical Biodiversity Area (CBA) and Ecological Support Area (ESA). No species of conservation importance were found on site. Seven Declared Weeds and Invader species were observed on the study site.

Existing dumping, lack of municipal services i.e. waste collection, as well as, aging, unmaintained municipal infrastructure i.e. sewage are seen as major contributing factors to the current degradation of the site.

No cultural heritage sites were found within the study area.

The site is located in Quaternary Catchment C21E, within the Upper Vaal Water Management Area (WMA). Quaternary Catchment C21E has a largely modified (class D) Present Ecological State (PES) and a High Ecological Importance and Sensitivity (EIS). The entire site is dominated by a depression hydro-geomorphic (HGM) wetland unit that has been modified by infilling, dumping, alien plants, stormwater inflows and

infrastructure, specifically sport fields and hard surface structures. Depression wetlands are endorheic wetland types that drain inward and are therefore not connected to the rest of the drainage network.

The proposed development is not expected to cause further degradation of the wetland even though the activities are located within wetland habitat. The affected depression wetland is Severely modified (class E PES) and will remain in this PES class in spite of the proposed development on the condition that indigenous species are used for the proposed open space development and that alien control is applied. An opportunity is therefore available to improve wetland habitat through the removal, or partial removal, of existing infill material and the control of alien plant species.

Even though the site is largely degraded, due to the majority of the site consisting of a wetland, the core wetland area as a whole is regarded as having a high ecological sensitivity.

Statement:

The construction impacts, if effectively managed according to the mitigation measures proposed in this report, the specialist reports and the draft EMPr will have a predominately low residual significance rating. Positive Moderate post mitigation significance ratings are anticipated in terms of removal of invader alien species, stimulation of the local economy through the creation of short term employment.

The operational impacts are anticipated to have a predominately positive moderate to high significance post mitigation. Negative impacts are anticipated to be limited predominately to low significance post mitigation. It should, however, be noted that the impacts of continued dumping, as well as sewage spillage and overflow, if left unmanaged in the surrounding area, will result in an anticipated negative impact of high post mitigation significance. All rehabilitation works will be highly compromised, should these impacts be allowed to continue.

Positive impacts include job creation and employment opportunities for both the construction and operational phases, as well as, skills transfer and development.

Other positive impact anticipated will be the protection and reestablishment of the threatened Soweto Highveld Grassland. Of note is that should the area be poorly rehabilitated the opposite will be true, resulting in the loss of the Soweto Highveld Grassland vegetation and associated loss in floral species richness and genetic diversity.

It should be reiterated that in the event that the lack of municipal services i.e. waste collection (resulting in dumping in open space) and lack of maintenance of municipal infrastructure not be addressed in the areas surrounding the site, all rehabilitation works and open space development will be highly compromised and ultimately be a wasted effort.

No-go Alternative:

The No-go Alternative implies that the Proposed Tuna Park Open Space will not take place. In this scenario, the receiving environment will not be impacted upon negatively in any manner, with particular reference to the construction phase. It also means that existing current bad environmental practices taking place (i.e. dumping and poor infrastructure maintenance) will be allowed to continue unabated, resulting in a further exacerbation of hazardous environmental conditions and degradation.

It should be noted that while no negative impacts will be incurred, the same can be said for positive impacts such as, the creation of employment and job opportunities, skills transfer and development.

This would not be ideal owing to the high unemployment rate in the local municipality. Additionally, direct employment benefits and community beneficiation will not materialize.

In light of the above, as well as the fact that all negative impacts can be adequately mitigated and managed, it is not recommended that the No-go Alternative be supported.

SECTION E: RECOMMENDATION OF PRACTITIONER

In light of the discussions in the sections above, it is recommended that the development be supported due to the high overall positive impacts, particularly with regards to the improved environmental health and safety of the area, as well as, the many socio-economic community benefits.

As discussed in the preceding section, all significant negative impacts can be successfully mitigated and managed to acceptable levels (i.e. moderate to low) during all phases of the proposed development.

All mitigation measures as detailed in this BAR, the attached Specialist Impact Assessments and the Draft Environmental Management Programme (EMPr) must be implemented and adhered for the duration of the project lifecycle (i.e. during the planning, construction and operational phases). In addition, the following specific recommendations apply:

Planning and Design Phase:

- All stormwater management features should be constructed in a manner that will ensure the continued functioning of the natural drainage lines and wetland features on the study site.
- All walkways/pedestrian pathways should be constructed of a material that is water permeable in order to minimise stormwater run-off or the ponding of water. In addition, appropriate stormwater features should be installed to minimise erosion.
- Before the construction phase commences, the applicant should meet with representatives from the local municipality to establish the existence of a skills database for the area. If such as database exists it should be made available to the contractors appointed for the construction phase.
- Community consultation is as an important component to help ensure the success and efficiency of the final rehabilitation actions and interventions.
- Footpaths and landscape areas should be located on areas designated as Infill and Disturbed outer zones as far as possible.
- Locate stockpiles outside of wetland habitat where possible.
- No new furrows, drains or dams should be created within delineated wetland areas.
- Walkways that are crossing the depression wetland should make use of elevated boardwalks rather than utilising bermed or infill walkways (e.g. walkways that are elevated by means of soil berms) which could facilitate surface run-off and erosion.

Construction Phase:

- A rehabilitation plan should be implemented near the end of the construction phase to address remnant impacts and control alien plants within the depression wetland. Several aliens are present in the wetland and targeted control using mechanical removal, landscape management (e.g. controlled burning) and herbicides will result in a positive project-associated impact.
- According to the Alien and Invader Species regulations, all declared alien weeds and invader plants must be effectively controlled or eradicated by means of an alien and invader control programme.
- Address the large scale removal of litter, and waste on the site (i.e. dumping) as a phased approach, integrating with rehabilitation activities. Ensure that agreements are in place with local landfill sites to receive this volume of waste.
- All construction activities must be restricted to daytime (e.g. from sunrise to sunset).
- All landscaping should make use of indigenous plants, and should preferably make use of plant species that are native to the area (e.g. native to the regional vegetation types). The use of *Pennisetum clandestinum* (kikuyu) as a "lawn" grass or ornamental should be avoided.

- As a precautionary principle, a brief follow-up survey during summer is recommended and aimed specifically at searching for potentially occurring threatened and near threatened plant species on the rocky grassland section contained within the Happiness Primary School yard. The follow-up survey is only applicable if development or land use activities are planned to take place within the rocky grassland habitat.
- Check vehicles regularly for oil leaks and only refuel in designated areas outside of wetland habitat.
- Provide and maintain portable toilets outside of wetland habitat during the construction phase.
- Provide clearly marked bins for litter and the discard of other waste materials.
- Remove dumped refuse and rubble from within the depression wetland and all associated affected infilled areas prior to the commencement of construction.
- Revegetate landscaped areas with indigenous wetland species during the start of the growing season.
- The trees to be used along the pedestrian streetscape should be indigenous and preferably hardy and draught resistant (e.g. *Searsia lancea*).

Operational Phase:

- A communal grazing plan should be formulated and implemented whereby grazing regimes are defined, and rotational grazing is allowed in order to improve the natural grassland condition and structure.
- Alien control of species identified should be undertaken once a year.
- Stormwater management should not impede or divert surface water flow, as any changes in surface water flow quality or quantity could have significant impacts on associated fauna groups.
- New erosion features, such as rills and headcut that may develop, should be stabilised once observed.
- Revegetate landscaped areas with indigenous wetland species during the start of the growing season.

Of crucial importance is that the lack of municipal services i.e. waste collection (resulting in dumping in open space) and lack of maintenance of municipal infrastructure be addressed in the areas surrounding the site prior to the commencement of rehabilitation works.

Attributable to the denude condition of the site, monitoring the progress of future rehabilitation (re-colonisation of both fauna and flora as well as wetland functioning) as part of the construction and operational plans, is recommended in the study area. Monitoring should take place during and after the construction activities in order to determine whether the current diversity increases with successful rehabilitation, as well as, if any additional intervention are needed to further improve the biodiversity functioning of the area.

Assuming that the above recommendations are implemented and adhered to, there is no reason why the proposed development should be supported due to the high overall positive impacts, particularly with regards to the improved environmental health and safety of the area, as well as, the many socio-economic community benefits.

There are no fatal flaws to this project, and all potentially negative impacts may be mitigated through careful management during all phases of the project lifecycle. The Environmental Assessment Practitioner therefore recommends that the development be supported.

SECTION F: APPENDIXES

Appendix A: Maps
- A.1: Locality Map
- A.2: Layout Map
- A.3: Phased Development Map
- A.4: CBA Sensitivity Map
- A.5: Wetland Zones Sensitivity Map
- A.6: Ecological Sensitivity Map
- A.7: Overall Sensitivity Map
- A.8: Sensitivity including Layout Map

Appendix B: Photoplates

Appendix C: Facility illustration(s)

Appendix D: Specialist reports
- D.1: Wetland Delineation Study
- D.2: Heritage Impact Assessment Report
- D.3: Ecology Evaluation Report

Appendix E: Public Participation

Appendix F: Impact Assessment

Appendix G: Environmental Management Programme (EMPr)

Appendix H: Details of EAP and expertise

APPENDIX A: MAPS
APPENDIX A.1: LOCALITY MAP

APPENDIX A.2: LAYOUT MAP

APPENDIX B: PHOTOPLATES

APPENDIX C: FACILITY ILLUSTRATIONS

APPENDIX D: SPECIALIST REPORTS
APPENDIX D.1: WETLAND DELINEATION STUDY