

ENVIRONMENTAL IMPACT ASSESSMENT REPORT

In terms of Procedures and format for submission of NEMA Section 24G Reports

for:

Legalization of the commencement of the clearance of 102.3852 ha of indigenous vegetation in order to formalise a township, currently known as the informal settlements of Goutrou and Hillside, situated on a Portion of the Remaining Extent of Erf 1, Hopetown, within the Thembelihle Local Municipality, Northern-Cape Province.

Report Date: December 2020



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COGHSTA
Department of Co-operative Governance,
Human Settlements and Traditional Affairs
of the Northern Cape

DRAFT REPORT

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**APPLICATION TO RECTIFY THE UNLAWFUL COMMENCEMENT
OR CONTINUATION OF LISTED ACTIVITIES IN TERMS OF
SECTION 24G OF THE NATIONAL ENVIRONMENTAL
MANAGEMENT ACT (NO 107 OF 1998)**

1. PROJECT TITLE

Legalization of the commencement of the clearance of 102.3852 ha of indigenous vegetation in order to formalise a township, currently known as the informal settlements of Goutrou and Hillside, situated on a Portion of the Remaining Extent of Erf 1, Hopetown, within the Thembelihle Local Municipality, Northern-Cape Province.

2. INTRODUCTION

AB Enviro Consult was appointed by the Thembelihle Local Municipality in association with the Department of Co-operative Governance, Human Settlements and Traditional Affairs of the Northern Cape (COGHSTA) to apply for Authorization for the “Proposed” Establishment of a Township on the site. A site inspection held on 23 November 2019 revealed that construction activities on site has already commenced and that the Applicant will have to apply for the rectification of unlawful commencement or continuation of a listed activity in terms of Section 24G of the National Environmental Management Act, 1998 (Act No. 107 of 1998) as amended.

Apart from the Informal Settlement that has taken place on site, other activities commenced with is mostly related to service provision in the form of VIP toilets, roads, standpipes and electricity. Stand numbers has also been allocated, indicating a planned formalization process. The Applicant was not aware that they required Environmental Authorization before starting with provision of essential services in the area.

The intension of this application is thus to legalise the commencement of the clearance of 102.3852 ha of indigenous vegetation in order to formalise a township, situated on a Portion of the Remaining Extent of Erf 1, Hopetown, within the Thembelihle Local Municipality, Northern-Cape Province.

Informal settlement has already taken place on site, as such the need for housing in the area is highlighted. As in the rest of South Africa, there is a housing shortage in the area. This is undesirable as Informal settlements consist of non-conventional housing built without complying with legal building procedures. Broadly, these crude dwellings mostly lack proper services, such as water supply, sanitation, drainage, waste disposal and proper road access. There is also a bond between poor housing and environmental conditions in informal settlements which also reflects poverty.

Linking basic services such as water to health is viewed as a false separation as these services are ‘intimately related to housing’. It becomes a housing issue if children playing outside the house contract diarrhea via ingesting pathogens from fecal matter which contaminates the land on which they play. Otherwise, it is the house which provides for shelter against injury, weather and disease. Improving the surroundings of the house is to limit severe health risks existing within poor quality housing.

The proposed development is to formalize a township and to provide the services associated with a town to people in the area. It was envisioned to develop the proposed town as early as 2014. A business plan for the two development sites have been prepared in 2014 but was never submitted to COGHSTA. It is

evident that from Google Earth Images of the area of 2013, the area has seen an influx of informal settlements. The occurrence of informal housing in the Municipality can be linked to an increase in urban population and the lack of properly planned sites with infrastructure. The formalization of the town is highly desirable as it will eliminate the negatives associated with informal housing as described above.

Large parts of vegetation at the site have been transformed or modified. Remaining vegetation is mainly karroid with few individual trees. Exotic trees occur at informal residential areas. The aggressive alien invasive tree *Prosopis glandulosa* is found at various places at the site. Indigenous trees include shrub-height *Diospyros lycioides* subsp. *lycioides*, *Vachellia tortilis*, *Ziziphus mucronata* and *Senegalia mellifera* subsp. *detinens*.

The tall shrub *Rhigozum trichotomum* is found in dense clumps at some places at the site. Other tall shrubs include *Lycium cinereum* and *Lycium horridum*. The succulent shrub *Hertia pallens* is widespread at remaining vegetation at the site occurs Low shrubs are visibly frequent at remaining vegetation at the site and include *Aptosimum marlothii*, *Pentzia globosa*, *Chrysocoma ciliata*, *Gnidia polycephala*, *Melolobium candicans*, *Plinthus karoocicus*, *Pteronia glauca*, *Selago geniculata* and *Zygophyllum* species. Herbaceous plant species include *Gazania krebsiana*, *Chamaesyce inaequilatera*, *Hermannia comosa*, *Indigofera alternans*, *Sesamum capense* and *Tribulus terrestris*. Indigenous grass species at the site include *Eragrostis lehmanniana*, *Eragrostis echinochloidea*, *Aristida congesta*, *Tragus berteronianus* and *Enneapogon desvauxii*.

Some of the alien invasive weed species at hirtherto bare ground or ecologically disturbed areas at the site are *Salsola kali*, *Argemone ochroleuca*, *Schkuhria pinnata*, *Xanthium spinosum*, *Chenopodium album*, *Alternanthera pungens* and *Datura ferox*.

As soon as the applicant became aware that Environmental Authorization was required, AB Enviro-Consult was appointed to obtain the necessary authorizations. An Environmental Screening Process was conducted by the EAP to ensure that all the relevant Environmental Legislation is taken into consideration. Desk top studies were conducted and alternatives assessed. Site inspections were carried out to verify the outcomes of the desktop studies, and the preferred alternative defined. A Botanical Specialist was appointed to conduct a Botanical survey of the area. This included a vegetation and habitat study to determine possible fatal flaws and to identify sensitive / no-go areas.

A full Public Participation Process was followed to obtain inputs from interested and affected parties. All the information obtained from the above mentioned processes was used to assess the Environmental Impact that the proposed development may have on the Environment and vice versa. The inputs from the Specialists, interested and affected parties, together with the knowledge of the EAP was used to determine measures to avoid, mitigate and manage potential impacts. These measures are described in the Environmental Management Programme.

2.1 DETAILS OF PROPERTY ON WHICH UNLAWFUL ACTIVITY TOOK PLACE:

The development is located on a portion of the remaining extent of Erf 1, Hopetown and consist of two informal settlements currently known as Goutrou and Hillside. The Goutrou informal settlement area is located on a portion of the Remainder of Erf 1, Hopetown and the Hillside informal settlement area on Erf 1492. Erf 1492 is registered at the Surveyor- General, but not at the Registrar of Deed, thus the two mentioned erven will fall under the original title deed of the Remainder of Erf 1, Hopetown.

The Goutrou informal settlement is located towards the east of the existing Steynville residential area and towards the north of the R369 road while the Hillside informal settlement is located towards the south of this Township and the R369. The R369 that goes to the Van der Kloof Dam, is the boundary between these two areas. See Figure 1 for a copy of the Locality Map.

The site is located in an area that falls under the jurisdiction of the Thembelihle Local Municipality and the Pixley ka Sem District Municipality, Northern-Cape Province.

The coordinates of the site are:

The Goutrou informal settlement

Latitude: 29°36'57.54" South

Longitude: 24°06'38.22" East

The Hillside informal settlement

Latitude: 29°37'26.06" South

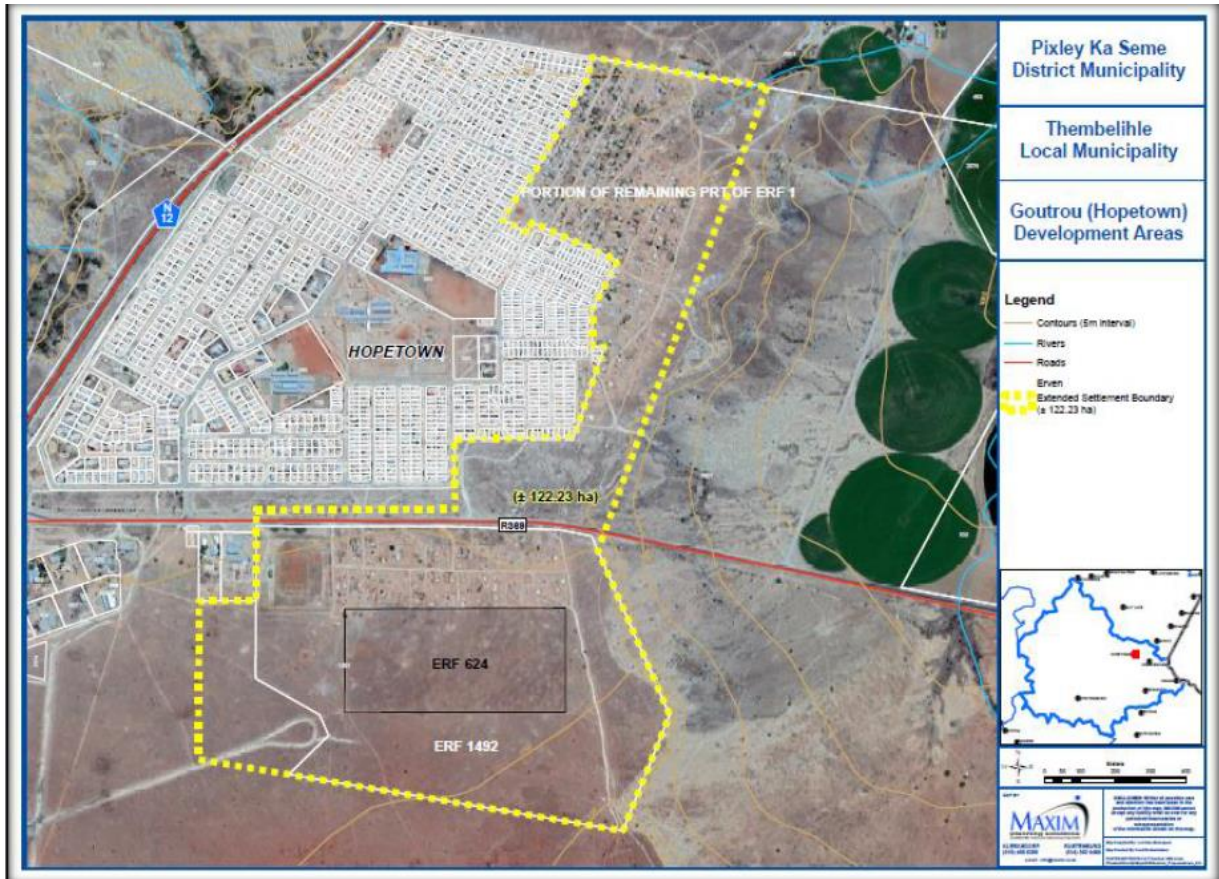
Longitude: 24°06'20.51" East

The Surveyor-general 21 digit site reference number is:

C	0	3	3	0	0	0	1	0	0	0	0	0	0	0	1	0	0	0	0	0
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Street address:	Access to the northern part of the site will be off Aandblom Street linking with the R369 and for the southern part of the site via a new road linking with the R369
Magisterial District or Town:	Thembelihle Local Municipality and the Pixley ka Sem District Municipality.

The largest part of the study area has been extensively disturbed and developed through informal residential settlement. See Photograph 1. Some areas has been heavily disturbed through quarrying (See Photograph 2) and trenching, while informal dumping of residential refuse and building rubble also occurs throughout the area as illustrated in Photograph 1.



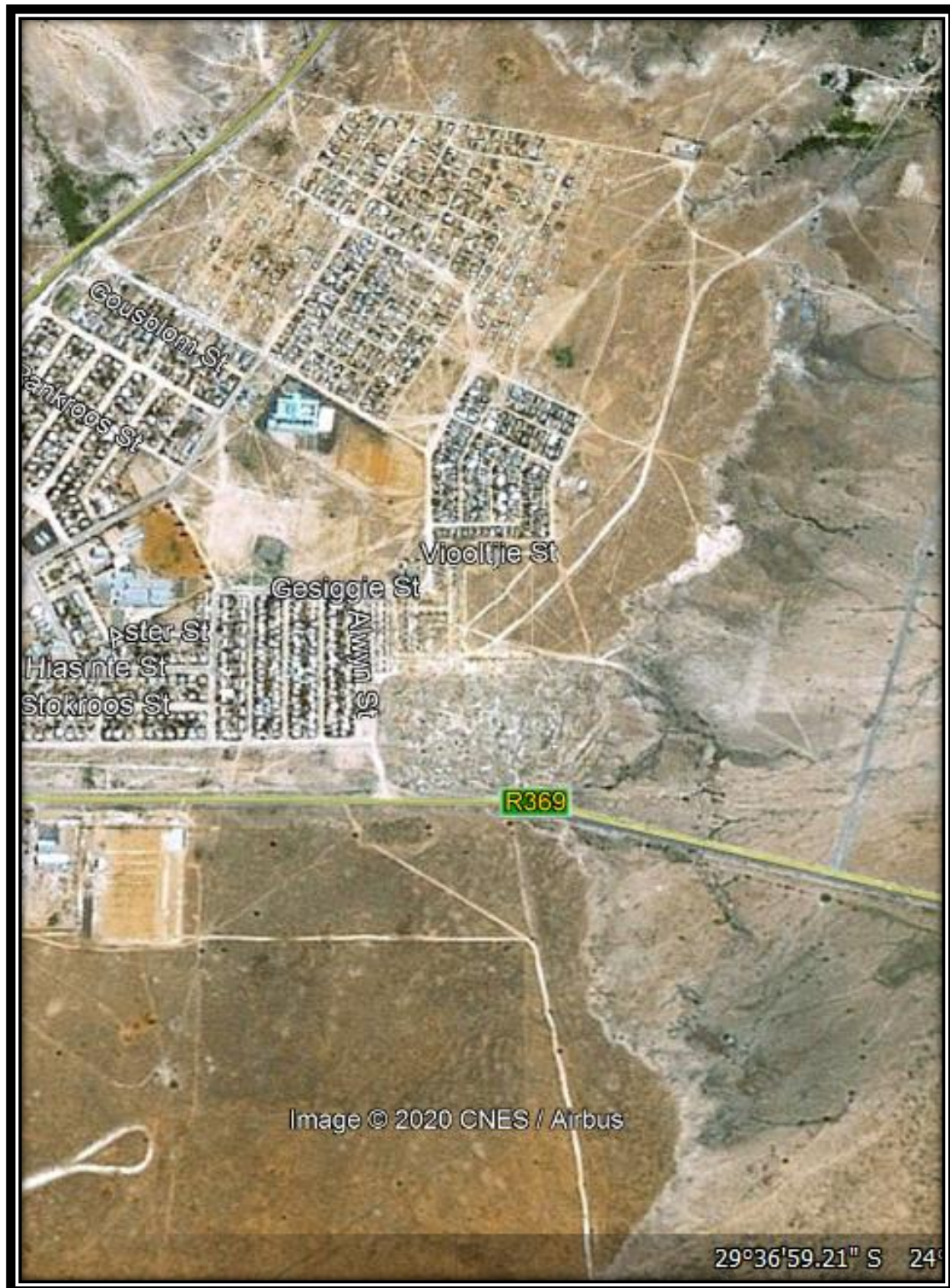


Photograph 2: Informal dumping took place in an area that is identified on the Topographical map as an old quarry.

2.2. DESCRIPTION OF THE ACTIVITY

What has been completed/ commenced with:

Satellite imagery shows the progression of informal settlement on site. The 2006 Google Earth image shows no signs of informal settlement. The 2013 Google Earth image shows settlement starting to take place at Goutrou. The first signs of settlement at Hillside can be seen on the 2016 Google Earth image while the 2018 Google Earth image (The latest available image) is an indication of the current extent of informal settlement on site.



The site: Pre- Informal settlement 2006





Informal Settlement at Hillside can be seen on this 4/6/2016 Google Earth image.



12/5/2018 Google Earth image indicates the current extent of informal settlement on site

Apart from the Informal Settlement that has taken place on site, other activities commenced with is mostly related to service provision in the form of VIP toilets (Photograph 3), roads (Photograph 4), standpipes and electricity (Photograph 4). Stand numbers has also been allocated, indicating a planned formalization process. See Photograph 5.

The Applicant was not aware that they required Environmental Authorization before starting with provision of essential services in the area.



Photograph 3: VIP toilets installed on site



Photograph 4: Graded and planned roads found on site. This photograph also illustrates the electricity infrastructure that has already been installed.



Photograph 5: Stand numbers have been allocated.

Large parts of vegetation at the site have been transformed or modified. Remaining vegetation is mainly karroid with few individual trees. Exotic trees occur at informal residential areas. The aggressive alien invasive tree *Prosopis glandulosa* is found at various places at the site. Indigenous trees include shrub-height *Diospyros lycioides* subsp. *lycioides*, *Vachellia tortilis*, *Ziziphus mucronata* and *Senegalia mellifera* subsp. *detinens*.

Informal developments had ecological impacts at the site. Loss of natural habitat with indigenous vegetation took place owing to informal developments. While it cannot be categorically stated that no threatened, near-threatened plant species were found at the site prior to the informal development, there are no distinct indicators that such species would have been at the site.

What still has to be completed?

The application deals with the formalization of this Township. This will include service provision and will involve re-layout of the Township. The layout plan will also address the issue of storm water. Figure 2 below is a copy of the proposed re-layout plan. The proposed new Township will consist of the following land uses.

Land use	Number of stands
Residential	1 500
Business	3
Church	3
Crèche	5
Primary School	1
Municipal	1
Parks	8

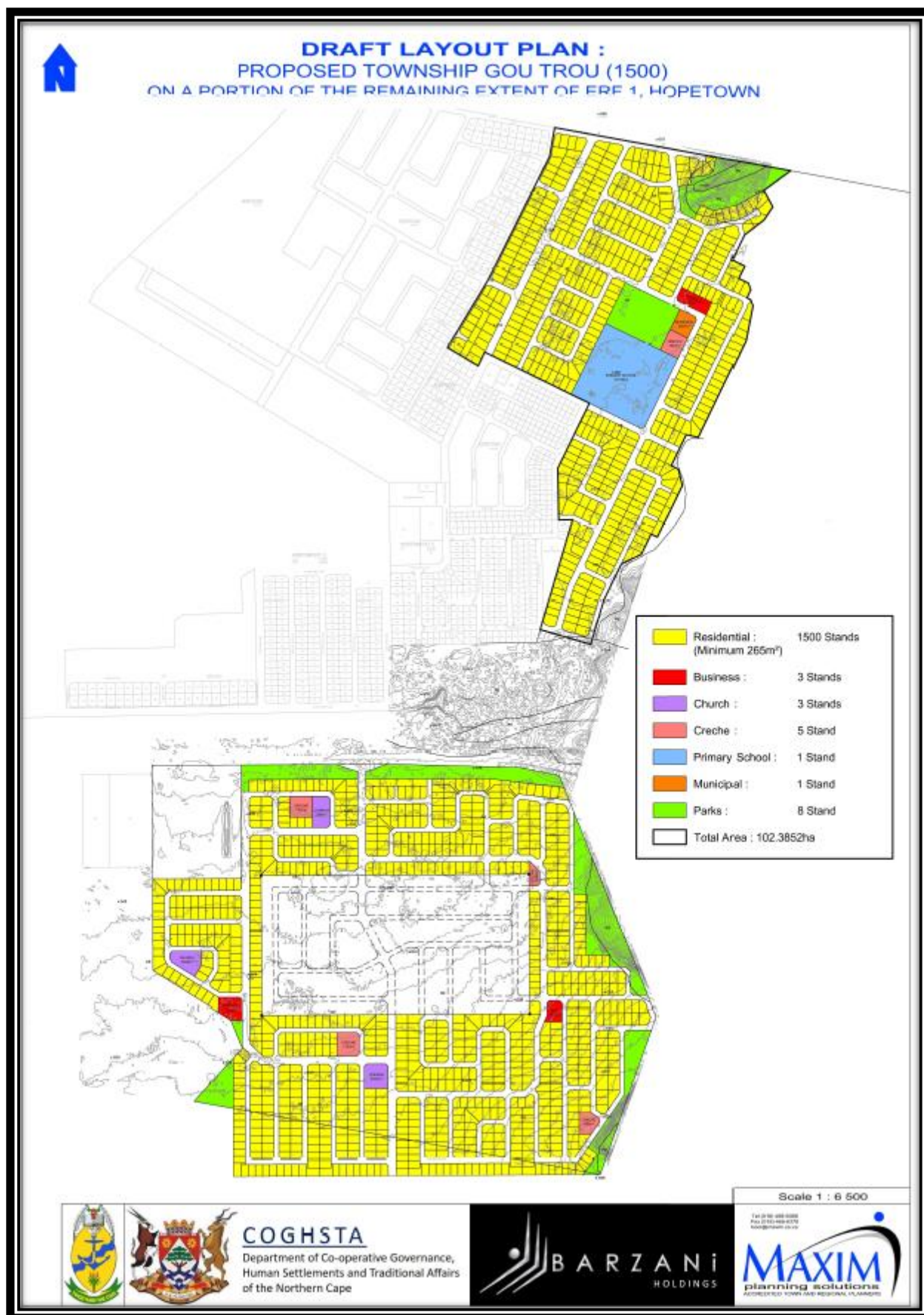


Figure 2: Proposed Re-Layout Plan.

2.3 SERVICES

The provision of basic services is essential for the people living in this informal settlement. Services will be provided for by the Local Municipality and will connect to Municipal infrastructure.

- **2.3.1 Bulk water supply**

Evaluation of capacity of bulk infrastructure:

The Civil Services Report's engineer came to the conclusion that the current Steynville reservoir does not contain sufficient capacity to serve the addition of a further 7750 people (1409 erven at 5.5 people/erf), with a resultant negative deficit when the additional populations is applied to the reserve capacity.

The following must be noted:

- The existing 150mmØ bulk water supply line between the existing Water Purification Works and Steynville Reservoir is currently sufficient but needs to be upgraded to accommodate the proposed development.
- In the case of the reservoir the capacity available for domestic use, as a result of the reserved volume of water for fire demand, is insufficient to serve the current domestic demand within a single day.

It is recommended to replace the existing bulk supply line from the water treatment works to the Steynville reservoir. It is proposed that a new feeder main be constructed to serve the population of Steynville. The new bulk main will be sized to serve the total domestic demand for the entire existing Steynville, Goutrou Area 1 (548 residential erven) and Goutrou Area 2 (952 residential erven).

The required pipe diameter is minimum 193mm Ø, however, considering the standard pipe diameters for uPVC pipes, the most suitable diameter will be a 200mmØ uPVC Class 9 pipe.

The Engineer came to the conclusion that the Concrete Reservoir capacity is insufficient to serve the additional proposed erven. Thus the necessity exists to increase the available storage capacity. It is recommended that a new reservoir to serve the proposed development be constructed in position at the site of the existing reservoir. The capacity of the new reservoir will be 48 hours of the AADD of entire population of the greater Steynville.

Additionally a fixed reserve capacity for fire demand must be provided based on the fire risk category for the total development served (i.e. existing plus proposed) To this end the fire risk category must be defined with relation to the development composition and definitions as set out in the Red Book.

This leads to the conclusion that the capacity for the new reservoir is proposed to be 2Mℓ. It is also clear from the elevation difference between the height of Elevated Storage Tank and the highest point of the proposed development of approximately 25m (2.5 bar), would lead to the fact that an additional elevated tower will not be required. Provision should also be made for a backup generator to provide power to the booster pump station providing water to the elevated storage tanks feeding the greater Steynville, to aid in the event of power disruptions.

A new Bulk Main to Proposed Development should be constructed to serve the proposed development. The new bulk main will be sized to serve the total domestic demand for Goutrou Area 1 (548 residential erven) and Goutrou Area 2 (952 residential erven). The required pipe diameter is minimum 160mm Ø, however, considering the standard pipe diameters for uPVC pipes, the most suitable diameter will be a 200mmØ uPVC Class 9 pipe.

The Goutrou area will require a pipe diameter is minimum 209mm Ø, however, considering the standard pipe diameters for uPVC pipes, the most suitable diameter will be a 200mmØ to 250mmØ pipe. In light of the above it is recommended that the proposed bulk main to the proposed development will be a 250 mm Ø uPVC Class 9 main. For the Goutrou Development it is suggested that the required pipe diameter is minimum 263mm Ø, however, considering the standard pipe diameters for uPVC pipes, the most suitable diameter will be a 315mmØ uPVC Class 9 pipe.



Proposed Bulk Water Infrastructure

Summary of Recommendations

- New 200mmØ Bulk Water Supply Line to Steynville.
- New 2Ml concrete reservoir at site of existing reservoir.
- New 315mmØ bulk water main approximately 760m in length.
- New 250mmØ bulk water main feeding Area 2 from the proposed 315mmØ above, approximately 180m in length.
- New 200mmØ bulk water main feeding Area 1 from the proposed 315mmØ above, approximately 1050m in length.

2.3.2 Sanitation

Goutrou Area: The proposed development site is located directly adjacent to Steynville which is fully serviced with flush toilets, and therefore in close proximity to existing services. The bulk capacity is expected to be sufficient to accommodate the additional inflow.

Hillside Area: VIP toilets have been installed for the informal dwellings. The existing oxidation ponds would be able to accommodate additional inflow.

Handling of effluent

The following proposal must be incorporated to bring the proposed Steynville Outfall Sewer Main to a standard that will accommodate the new infrastructure.

Based on the technical report compiled by Worley Parsons in April 2020, it is proposed that a new outfall line be constructed and discharge the sewerage to existing oxidation ponds.

According to the Civil Services Report; taking into consideration the estimated peak wet weather flow of 55.65ℓ/s and a design life of twenty years (20), it is envisaging that a new 315mm diameter uPVC line be constructed. The increased conduit size will avoid surcharging within the sewer and allow energy line to stay within the conduit. The length of the considered pipeline is approximately 2120m. The exact route of the pipeline should be considered and agreed during final design stage.

It will also be imperative to look into the specifications of the existing Rising Main. From the results of an analysis of data it became clear that the existing Rising Main have sufficient capacity to serve the new demands.

The Bulk Sewer Pump Station accommodates the sewer from the entire Hopetown. The total effluent generated amounts to a combined Peak Wet Weather Flow (PWWF) of 1468.464m³/day (16.996ℓ/s).

The proposed Goutrou Sewer Pump Station will be designed to accommodate an inflow of 18ℓ/s. The Pump Station will be approximately 5.5m deep and be equipped with a dry sump installed sewer pump set complete. It is concluded by the Engineer that it should be sufficient in capacity to meet the needs of the proposed development. The pump stations at Vergenoeg and Tambo Square will also need refurbishment.

According to the Civil Engineer's report, the 315 mmØ rising main and the WTW has sufficient capacity to serve the addition of a further 9763 people (1775 erven at 5.5 people/erv), with a residual capacity of 20449 and 14426 people for the bulk pipeline and WTW respectively.

2.3.3 Storm water

The traditional design of storm water drainage systems has been to collect and convey storm water runoff as rapidly as possible to a suitable location where it can be discharged. We are also more conscious of the quality of the environment and the impact that uncontrolled increases in runoff can have on landowners.

The objective of a storm water management plan should be to manage the storm water resources of the collective watersheds to:

- Prevent flood damage.
- Preserve the natural and beneficial functions of the natural drainage system.
- Preserve and enhance storm water quality.

The collection and concentration of storm water will be kept to an absolute minimum so as not to impact negatively on any natural watercourse.

Currently the greater Steynville has no existing formal storm water infrastructure, with all storm water draining on the surface within the existing roads infrastructure toward the natural watercourses.

Goutrou:

As discussed previously in the report Goutrou has a watershed running across the development. Approximately half of the proposed development gravitates in a northerly direction towards the Orange

River at approximately 1.3%, while the other half of the site drains in a south easterly direction at approximately 1%.

Storm water drainage will be accommodated above the surface within the road reserves to natural water courses surrounding the proposed development. No provision will be made for Bulk Storm Water infrastructure however, storm water should be taken into account when designing the internal services on the proposed project.

Hillside:

The abovementioned area has a 1% slope from the south in the direction of the R369 Provincial Road to the north. Storm Water will be accommodated on the surface within the road reserves and gravitate towards the R369. Therefore, no Bulk Storm Water infrastructure will be required for this portion of the development, however, storm water should be taken into account when designing the internal services on the proposed project.

2.3.4 Waste removal

A new dumping site has been constructed towards the south of Hopetown relieving pressure on the existing one in the middle of Town.

2.3.5 Electricity

According to the Electrical Services report: Hopetown is currently supplied from their Municipal Main Intake 22/11kV "Ster" Substation which is supplied from the Eskom "Osborne-Waterford" 22kV feeder. The Goutrou development is already serviced and is supplied from the Municipal "Ster" Substation via an 11kV overhead "Hare" line which has adequate capacity for the Goutrou South (Hillside) development.

The bulk supply limitations on the Municipal and upstream Eskom network are summarised as follows:

- a) The Notified Maximum Demand (NMD) at the Municipal Intake 22/11kV "Ster" Substation is 1,8MVA and is fully utilized. Hence, the NMD must be increased as per the load estimate requirements.
- b) The upstream Eskom "Osborne-Waterford" 22kV feeder which supply the Municipal "Ster" Substation has 2MVA spare capacity and could accommodate approximately 800 low-income erven. The installation of a Voltage Regulator on this Eskom feeder will accommodate the proposed development in Goutrou South (Hillside).

2.3.6 Roads

The Traffic Impact Assessment investigated the expected transport related impacts of the proposed Goutrou Township development with 1 500 Erven. The study investigated the worst case potential impact of the Township on the external road network.

SURROUNDING ROAD NETWORK:

N12: The N12 is a National Class 1 road. Access to the northern part of the site may be taken via Jakaranda Street which links with the N12.



R369: The R369 is a Class 2 provincial road. Access to the northern part of the site will be off Aandblom Street linking with the R369 and for the southern part of the site via a new road linking with the R369.



Based on the TIA site observations, the existing and base traffic volumes shown in the figures, as well as the capacity analysis, it is concluded that the proposed development will have little impact on the external road network.

The TIA proposed and concluded:

- ***Signalisation of the intersection of the N12, Widd Road and R369 when warranted.***
- ***It is recommended that provision is made for sidewalks along the school site frontages.***
- ***It is recommended that provision is made for traffic calming along the school site roads.***

2.4 Alternatives

One of the objectives of an EIA is to investigate alternatives to the proposed project. The IEM procedure stipulates that the environmental investigation needs to consider feasible alternatives for any proposed development. Therefore, a number of possible proposals or alternatives for accomplishing the same objectives should be identified and investigated. In order to ensure that the proposed development enables sustainable development, feasible alternatives must be explored (S. Cliff, 2015).

The identification, description, evaluation and comparison of alternatives are important for ensuring a sound environmental scoping process. Alternatives should be considered as a norm within the Environmental Process (S. Cliff, 2015).

The alternatives considered for the proposed development includes land use alternatives (including the No-go option). The various alternatives will be assessed in this report, in terms of environmental, social and technical feasibility.

Land Use Alternatives

Mixed land use township (Alternative 1)

Alternative Site layouts have been developed for the proposed development.

The appointed Town and Regional planner have produced the proposed layout plan.

Although the emphasis is on housing, complimentary land uses have been included in the township. People want easy access to job opportunities, shops, banking facilities, clinics, etc. and want their living environment, such as residential townships to be placed at strategic positions with good access routes in close proximity to these amenities.

A mixed land use development is *socially responsible* based on the following:

- It covers the mixed and lower income bracket by providing a higher density housing option;
- The development will inevitably support the use of public transport;
- The development will include supporting social infrastructure (schools), as well as some retail or commercial activities;
- The layout of the development must respond to the future road planning for the area, to facilitate and maximise pedestrianisation and public transport.
- Commercial erven can accommodate a shopping centre, to service the existing formalised and informal settlements in the area. The commercial node will:
 - Promote entrepreneurial services and products;
 - Be within walking distance to places of refreshment and trade for residents;
 - Provide Job opportunities; and
 - Improve neighbourhood quality.

Single land use: Housing only (Alternative 2)

By providing only one land use type (i.e., housing), mixed income development and social integration across race and income levels, cannot be achieved.

A Commercial node on site is commonly utilised as a “Multi-Purpose Community Centre/Rural Service Centre” which is defined as “a focal point at which a range of essential services can be obtained by people living in its vicinity”. In turn, a commercial node acts as a pool of human and physical resources from which the inputs necessary for development can be distributed efficiently, and from which a community can draw to promote their development”.

By restricting a township to one land use only, the above benefits to the local community, and subsequent council area, cannot be realised, and hence, is not a preferred land use option.

No-go Alternative

The only other alternative that exists for the proposed development is the “no-go” option which will imply that the status quo will prevail. This is unacceptable as Informal settlements consist of non-conventional housing built without complying with legal building procedures. Broadly, these crude dwellings mostly lack proper indoor infrastructure, such as water supply, sanitation, drainage, waste disposal and proper road access. There is also a bond between poor housing and environmental conditions in informal settlements which also reflects poverty. Linking basic services such as water to health is viewed as a false separation as these services are ‘intimately related to housing’. It becomes a housing issue if children playing outside the house contract diarrhoea via ingesting pathogens from faecal matter which contaminates the land on which they play. Otherwise, it is the house which provides for shelter against injury, weather and disease. Improving the surroundings of the house is to limit severe health risks existing within poor quality housing.

2.5 Description of the Authorization process followed

Table 1: Environmental Impact Assessment Report in terms of Section 24G (1) (a)(vii) (aa)-(ee) of the National Environmental Management Act (Act 107 of 1998) (NEMA) as amended.

Section	Description of Requirements for Impact Assessment Reports	Location in this report
Section 24G (1) (a)(vii) (aa)	a description of the need and desirability of the activity	Paragraph 3
Section 24G (1) (a)(vii) (bb)	an assessment of the nature, extent, duration and significance of the consequences for or impacts on the environment of the activity, including the cumulative effects and the manner in which the geographical, physical, biological, social, economic and cultural aspects of the environment may be affected by the proposed activity	Appendix H
Section 24G (1) (a)(vii) (cc)	a description of mitigation measures undertaken or to be undertaken in respect of the consequences for or impacts on the environment of the activity;	Paragraph 8
Section 24G (1) (a)(vii) (dd)	a description of the public participation process followed during the course of compiling the report, including all comments received from interested and affected parties and an indication of how the issues raised have been addressed;	Paragraph 10 and Appendix I
Section 24G (1) (a)(vii) (ee)	an environmental management programme	Appendix J

The purpose of this document is to adhere to the requirements for compilation of Environmental Impact Assessment Reports as amended and published in Government Notice R. 326 of 7 April 2017, Appendix 2, and the National Environmental Management Act (Act 107 of 1998) (NEMA).

In order to assess a proposed development it is important to take into consideration the principles of NEMA. These principles are outlined in Chapter 1 and read as follows:

- 1) “The principles set out in this section apply throughout the Republic to the actions of all organs of state that may significantly affect the environment and—

- a. *shall apply alongside all other appropriate and relevant considerations, including the State's responsibility to respect, protect, promote and fulfil the social and economic rights in Chapter 2 of the Constitution and in particular the basic needs of categories of persons disadvantaged by unfair discrimination;*
 - b. *serve as the general framework within which environmental management and implementation plans must be formulated;*
 - c. *serve as guidelines by reference to which any organ of state must exercise any function when taking any decision in terms of this Act or any statutory provision concerning the protection of the environment;*
 - d. *serve as principles by reference to which a conciliator appointed under this Act must make recommendations; and*
 - e. *guide the interpretation administration and implementation of this Act, and any other law concerned with the protection or management of the environment.*
- 2) *Environmental management must place people and their needs at the forefront of its concern, and serve their physical, psychological, developmental, cultural and social interests equitably.*
 - 3) *Development must be socially, environmentally and economically sustainable.*
 - 4) (a) *Sustainable development requires the consideration of all relevant factors including the following:*
 - (i) *That the disturbance of ecosystems and loss of biological diversity are avoided, or, where they cannot be altogether avoided, are minimised and remedied;*
 - (ii) *that pollution and degradation of the environment are avoided, or, where they cannot be altogether avoided, are minimised and remedied;*
 - (iii) *that the disturbance of landscapes and sites that constitute the nation's cultural heritage is avoided, or where it cannot be altogether avoided, is minimised and remedied;*
 - (iv) *that waste is avoided. or where it cannot be altogether avoided, minimised and re-used or recycled where possible and otherwise disposed of in a responsible manner;*
 - (v) *that the use and exploitation of non-renewable natural resources is responsible and equitable, and takes into account the consequences of the depletion of the resource;*
 - (vi) *that the development use and exploitation of renewable resources and the ecosystems of which they are part do not exceed the level beyond which their integrity is jeopardised;*
 - (vii) *that a risk-averse and cautious approach is applied, which takes into account the limits of current knowledge about the consequences of decisions and actions; and*
 - (viii) *that negative impacts on the environment and on people's environmental rights be anticipated and prevented, and where they cannot be altogether prevented, are minimised and remedied.*
 - (b) *Environmental management must be integrated, acknowledging that all elements of the environment are linked and interrelated, and it must take into account the effects of decisions on all aspects of the environment and all people in the environment by pursuing the selection of the best practicable environmental option.*
 - (c) *Environmental justice must be pursued so that adverse environmental impacts shall not be distributed in such a manner as to unfairly discriminate against any person, particularly vulnerable and disadvantaged persons.*
 - (d) *Equitable access to environmental resources, benefits and services to meet basic human needs and ensure human well-being must be pursued and special measures may be taken to ensure access thereto by categories of persons disadvantaged by unfair discrimination.*
 - (e) *Responsibility for the environmental health and safety consequences of a policy, programme, project, product, process, service or activity exists throughout its life cycle.*
 - (f) *The participation of all interested and affected parties in environmental governance must be promoted, and all people must have the opportunity to develop the understanding, skills and capacity necessary for achieving equitable and effective participation and participation by vulnerable and disadvantaged persons must be ensured.*

- (g) *Decisions must take into account the interests, needs and values of all interested and affected parties, and this includes recognizing all forms of knowledge, including traditional and ordinary knowledge.*
- (h) *Community wellbeing and empowerment must be promoted through environmental education, the raising of environmental awareness, the sharing of knowledge and experience and other appropriate means.*
- (i) *The social, economic and environmental impacts of activities, including disadvantages and benefits must be considered, assessed and evaluated and decisions must be appropriate in the light of such consideration and assessment.*
- (j) *The right of workers to refuse work that is harmful to human health or the environment and to be informed of dangers must be respected and protected.*
- (k) *Decisions must be taken in an open and transparent manner, and access to information must be provided in accordance with the law.*
- (l) *There must be intergovernmental co-ordination and harmonisation of policies, legislation and actions relating to the environment.*
- (m) *Actual or potential conflicts of interest between organs of state should be resolved through conflict resolution procedures.*
- (n) *Global and international responsibilities relating to the environment must be discharged in the national interest.*
- (o) *The environment is held in public trust for the people, the beneficial use of environmental resources must serve the public interest and the environment must be protected as the people's common heritage.*
- (p) *The costs of remedying pollution, environmental degradation consequent adverse health effects and of preventing, controlling or minimizing further pollution, environmental damage or adverse health effects must be paid for by those responsible for harming the environment.*
- (q) *The vital role of women and youth in environmental management and development must be recognised and their full participation therein must be promoted.*
- (r) *Sensitive, vulnerable, highly dynamic or stressed ecosystems, such as coastal shores, estuaries, wetlands and similar systems require specific attention in management and planning procedures, especially where they are subject to significant human resource usage and development pressure."*

The above mentioned principals and the applicable legislation, Policies and Guidelines as described in Paragraph 4 of this Report were taken into account in the assessment of the Environmental Impacts for the proposed development. The process followed can be described as follows:

- 1) AB Enviro Consult was appointed by the Thembelihle Local Municipality in association with the Department of Co-operative Governance, Human Settlements and Traditional Affairs of the Northern Cape (COGHSTA) to apply for Authorization for the "Proposed" Establishment of a Township on the site.
- 2) A site inspection held on 23 November 2019 revealed that construction activities on site has already commenced and that the Applicant will have to apply for the rectification of unlawful commencement or continuation of a listed activity in terms of Section 24G of the National Environmental Management Act, 1998 (Act No. 107 of 1998) as amended. Apart from the Informal Settlement that has taken place on site, other activities commenced with is mostly related to service provision in the form of VIP toilets, roads, standpipes and electricity. Stand numbers has also been allocated, indicating a planned formalization process.
- 3) The Applicant was not aware that he required Environmental Authorization before starting with provision of essential services in the area.

- 4) An Environmental Screening Process was conducted by the EAP to ensure that all the relevant Environmental Legislation is taken into consideration.
- 5) Desk top studies were conducted and alternatives assessed.
- 6) Site inspections were carried out to verify the outcomes of the desktop studies, and the preferred alternative defined.
- 7) A Botanical Specialist was appointed to conduct a Botanical survey of the area. This included a vegetation and habitat study to determine possible fatal flaws and to identify sensitive / no-go areas.
- 8) A Town and Regional Planner designed the proposed development in such a way that the layout of the proposed development, takes into account the measures described by the Civil Engineer and that the layout satisfies the needs of future occupiers of the site.
- 9) A Traffic Engineer was also appointed to ensure the access to the sites and road layouts are acceptable to the increased number of stands.
- 10) A Geotechnical Engineer was appointed to determine whether the Geology and Soils of the site is suitable for the proposed development
- 11) The Civil Engineer was appointed to determine the capability of existing infrastructure to be linked to proposed development and readily available bulk services. He also designed the proposed infrastructure.
- 12) A SAHRA Specialist has been appointed to determine the possible impact of the development on Archaeological and Cultural features.
- 13) A full Public Participation Process was followed to obtain inputs from interested and affected parties.
- 14) All the information obtained from the above mentioned processes was used to assess the Environmental Impact that the proposed development may have on the Environment and vice versa.
- 15) The inputs from the Specialists, interested and affected parties, together with the knowledge of the EAP was used to determine measures to avoid, mitigate and manage potential impacts. These measures are described in the Environmental Management Programme.

3. NEED AND DESIRABILITY OF THE DEVELOPMENT

Informal settlement has already taken place on site, as such the need for housing in the area is highlighted. As in the rest of South Africa, there is a housing shortage in the area. This is undesirable as Informal settlements consist of non-conventional housing built without complying with legal building procedures. Broadly, these crude dwellings mostly lack proper indoor infrastructure, such as water supply, sanitation, drainage, waste disposal and proper road access. There is also a bond between poor housing and environmental conditions in informal settlements which also reflects poverty.

Linking basic services such as water to health is viewed as a false separation as these services are 'intimately related to housing'. It becomes a housing issue if children playing outside the house contract diarrhea via ingesting pathogens from fecal matter which contaminates the land on which they play. Otherwise, it is the house which provides for shelter against injury, weather and disease. Improving the surroundings of the house is to limit severe health risks existing within poor quality housing.

The proposed development is to formalize a township and to provide the services associated with a town to people in the area. It was envisioned to develop the proposed town as early as 2014. A business plan for the two development sites have been prepared in 2014 but was never submitted to COGHSTA. It is evident that from 2013 the area has seen an influx of informal settlements. The occurrence of informal housing in the Municipality can be linked to an increase in urban population and the lack of properly planned sites with infrastructure. The formalization of the town is highly desirable as it will eliminate the negatives associated with informal housing as described above.

The preparation, submission and approval of the business plan to COGHSTA should be seen against the following background that highlights the need and desirability of the development:

- A constant increasing demand for affordable housing within the municipal area;
- The impact of the housing demand on municipal services and land needed therefore;
- The implementation of a well-structured and designed town planning and survey procedure;
- The poor financial and institutional capacity of the Local Authority to proceed with such planning and survey exercises;
- Conducting of a properly structured public participation process; and
- The shortage of funding and budget constraints within the municipal budget to drive such a process and the payment, therefore

Housing Needs

There is no formal updated housing waiting list available at the municipality. Some existing data has however been identified to assist in this regard.

The housing backlog for Hopetown is **1202 housing units**, with a housing supply of zero, according to the Pixley ka Seme District Municipality: Human Settlement Sector Plan and the Thembelihle IDP 2015/2016, this number may be outdated as there seems to be no updated figure in regard to housing backlog in the Municipality.

The above mentioned statistics should be viewed against the fact that the driving factor behind the increased need for housing in Thembelihle Local Municipality is the in-migration of rural households into the urban centres of the municipality, in seek of improved economic opportunities, access to better facilities and improved services.

The proposed development will:

- Provide services associated with the formalization of a town to future occupiers as well as the residents of the neighboring areas.
- During the construction phase of the proposed development, employment opportunities will be created and thus decrease the unemployment rate of the area.
- During the operational phase of the proposed development, additional employment opportunities will be created.
- The tax base of the Thembelihle Local Municipality will be broadened

4. APPLICABLE LEGISLATION, POLICIES AND/OR GUIDELINES

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

Title of legislation, policy or guideline	Applicability to the project	Administering authority	Date
National Environmental Management Act No. 107 of 1998 as amended.	NEMA is South Africa's overall environmental legislation and has, as its primary objective to provide for co-operative governance by establishing principles for decision making on matters	National & Provincial	27 November 1998

	<p>affecting the environment, institutions that will promote co-operative governance and procedures for co-ordinating environmental functions exercised by organs of state and to provide for matters connected therewith (Government Gazette, 1998).</p> <p>The Act provides for the right to an environment that is not harmful to the health and well-being of South African citizens; the equitable distribution of natural resources, sustainable development, environmental protection and the formulation of environmental management frameworks (Government Gazette, 1998).</p> <p>Section 30 (1, 3 and 4) of NEMA states that:</p> <p>(1)(a) "incident" means an unexpected sudden occurrence, including a major emission, fire or explosion leading to serious danger to the public or potentially serious pollution of or detriment to the environment, whether immediate or delayed. (b) "responsible person" includes any person who; (i) Is responsible for the incident; (ii) Owns any hazardous substance involved in the incident; or (iii) Was in control of any hazardous substance involved in the incident at the time of the incident;</p> <p>(3) The responsible person or, where the incident occurred in the course of that person's employment, his or her employer must forthwith after knowledge of the incident, report through the most effective means reasonably available (a) the nature of the incident; (b) any risks posed by the incident to public health, safety and property; (c) the toxicity of substances or by-products released by the incident; and (d) any steps that should be taken in order to avoid or minimise the effects of the incident on public health and the environment to; (i) the Director-General; (ii) the South African Police Services and the relevant fire prevention service; (iii) the relevant provincial head of department or municipality; and (iv) all persons whose health may be affected by the incident.</p> <p>(4)The responsible person or, where the incident occurred in the course of that person's employment, his or her</p>		
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	<p>employer, must, as soon as reasonably practicable after knowledge of the incident; (a) take all reasonable measures to contain and minimise the effects of the incident, including its effects on the environment and any risks posed by the incident to the health, safety and property of persons; (b) undertake clean-up procedures; (c) remedy the effects of the incident; (d) assess the immediate and long-term effects of the incident on the environment and public health.</p>		
<p><i>The Bill of Rights, Constitution of South Africa, Section 27 (1)(b)</i></p>	<p>The Constitution of the Republic of South Africa is the legal source of all law, including environmental law, in South Africa. The Bill of Rights is fundamental to the Constitution of South Africa and in, section 24 of the Act, it is stated that:</p> <p>Everyone has the right (a) to an environment that is not harmful to their health or well-being; and (b) to have the environment protected, for the benefit of present and future generations through reasonable legislative and other measures that (i) prevent pollution and ecological degradation; (ii) promote conservation; and (iii) secure ecologically sustainable development and use of natural resources while promoting justifiable economic and social development.</p> <p>Given that environmental management is founded partly on the principles of public participation, Section 195 of the Constitution is of primary relevance:</p> <p>(1) Public administration must be governed by the democratic values and principles enshrined in the constitution, including the following principles: (a) (b) (c) (d) (e) Peoples needs must be responded to, and the public must be encouraged to participate in policymaking. (f) Public administration must be accountable. (g) Transparency must be fostered by providing the public with timely, accessible and accurate information (Government Gazette, 1996).</p>	National Government	1994
<p><i>New Regulations 2014 in terms of NEMA</i></p>	<p>Legislation consulted during the environmental impact assessment process to determine whether any listed activities would be triggered. The Regulations were also consulted to determine inter alia the requirements regarding the contents of reports and environmental management</p>	National & Provincial	Amended 7 th of April 2017 Regulation following on from the 4 th December 2014 regulations

	programmes and the public participation process that should be followed.		
National Water Act (36 OF 1998)	<p>National Water Act (NWA), 1998 (Act 36 of 1998) is the primary statute providing the legal basis for water management in South Africa and has to ensure ecological integrity, economic growth and social equity when managing and using water.</p> <p>The major objectives of the National Water Act are to:</p> <ul style="list-style-type: none"> •Aid in providing basic human needs; •Meet the growing demand of water in a sustainable manner; •Ensure equal access to water and use of water resources; •Protect the quality of water of natural resources; •Ensure integrated management of water resources; •Foster social and economic development; and •Conserve aquatic and related ecosystems. <p>Section 19 of the National Water Act states that the person responsible for land upon which any activity is or was performed which causes, has caused or is likely to cause, pollution of a water resource, must take all reasonable measures to prevent any such pollution from occurring, continuing or recurring.</p> <p>Chapter 3 of the National Water Act (36 of 1998), deals with pollution of water resources following an emergency incident, such as an accident involving the spilling of a harmful substance that finds or may find its way into a water resource. In terms of Section 30 of NEMA and Section 20 of the National Water Act, the responsibility for remedying the situation rests with the person responsible for the incident or the substance involved. If there is a failure to act, the relevant Catchment Management Agency may take the necessary steps and recover the costs from every responsible person.</p>	Department of water and sanitation	1998
National Environmental Management: Biodiversity Act (NEMBA) (ACT NO. 10 OF 2004)	The National Environmental Management Biodiversity Act, 2004 (Act No. 10 of 2004), provides for the management and conservation of South Africa's biodiversity within the framework of the National Environmental Management Act, 1998; the protection of species and ecosystems that warrant national protection; the sustainable use	National & Provincial	2004

	<p>of indigenous biological resources; the fair and equitable sharing of benefits arising from bio-prospecting involving indigenous biological resources; the establishment and functions of a South African National Biodiversity Institute; and for matters connected therewith.</p> <p>In terms of Chapter 4 of the Above Act:</p> <p>52. (1) (a) The Minister may, by notice in the Gazette, publish a national list of ecosystems that are threatened and in need of protection.</p> <p>(b) An MEC for environmental affairs in a province may, by notice in the Gazette, publish a provincial list of ecosystems in the province that are threatened and in need of protection.</p> <p>(2) The following categories of ecosystems may be listed in terms of subsection:</p> <p>(a) critically endangered ecosystems, being ecosystems that have undergone severe degradation of ecological structure, function or composition as a result of human intervention and are subject to an extremely high risk of irreversible transformation;</p> <p>(b) endangered ecosystems, being ecosystems that have undergone degradation of ecological structure, function or composition as a result of human intervention, although they are not critically endangered ecosystems;</p> <p>(c) vulnerable ecosystems, being ecosystems that have a high risk of undergoing significant degradation of ecological structure, function or composition as a result of human intervention, although they are not critically endangered ecosystems or endangered ecosystems; and</p> <p>(d) protected ecosystems, being ecosystems that are of high conservation value or of high national or provincial importance, although they are not listed in terms of paragraphs (a), (b) or (c).</p> <p>(3) A list referred to in subsection (1) must describe in sufficient detail the location of each ecosystem on the list.</p> <p>53 (1) The Minister may, by notice in the Gazette, identify any process or activity</p>	
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	<p>in a listed ecosystem as a threatening process.</p> <p>(2) A threatening process, identified in terms of subsection (1) must be regarded as a specified activity contemplated in section 24(2)(b) of the National Environmental Management Act (1998) and a listed ecosystem must be regarded as an area identified for the purpose of that section.</p>		
<p>National Environmental Management: Protected Areas Act (ACT NO. 57 OF 2003)</p>	<p>This Act aims to provide for a national system of protected areas in South Africa as part of a strategy to manage and conserve its biodiversity. The Protected Areas Act tries to ensure the protection of the entire range of biodiversity, referring to natural landscapes and seascapes. The Act makes express reference to the need to move towards Community Based natural Resource Management (CBNRM) as its objectives include promoting the participation of local communities in the management of protected areas. The purpose of the Act is:</p> <ul style="list-style-type: none"> •To protect ecologically viable areas representative of South Africa's biological diversity and its natural landscapes and seascapes and their ecological integrity. •To conserve biodiversity in those areas; •To protect South Africa's rare species; •To protect vulnerable or ecologically sensitive areas; •To assist in ensuring the sustained supply of environmental goods and services; •To provide for the sustainable use of natural and biological resources; •To create or augment destinations for nature-based tourism; •To manage the interrelationship between natural environmental biodiversity, human settlement and economic development; •To contribute to human, social, cultural, spiritual and economic development; •To rehabilitate and restore degraded ecosystems and promote the recovery of endangered and vulnerable species. <p>This Act further stipulates various criteria which must be met before an area can be declared as a special nature reserve, national park, nature reserve and protected environment. It also prescribes a range of procedures, including consultation and public</p>	National & Provincial	2003

	participation procedures which must be followed before any of the kinds of protected areas are declared.		
Mineral and Petroleum Resources Development Act (MPRDA), Act 28 of 2002	<p>The Act distinguishes between mining permits and mining rights as follows:</p> <p>Mining Permit: Required where the activity will last less than two years and affects an area of less than 1.5ha in extent (valid for 3 years). In terms of the Act a mining permit requires a submission of an Environmental Management Plan (EMP to DME for approval prior to the onset of activities).</p> <p>Mining Right: Required for larger mining operations (renewable and valid for 30 years). In terms of the Act a mining right requires the submission of an Environmental Management Programme (EMProg) to DME for approval prior to the onset of activities.</p> <p>In light of their limited spatio-temporal extent, borrow pits (for the provision of construction material) and quarry operations would typically require a mining permit.</p> <p>The closure of borrow pits requires the submission of a closure application; this must be submitted within 180 days after ceasing operations. It is important to recognise that the mining right/permit holder's liability persists until such time as a Closure Certificate has been issued by DME.</p>	Relevant Provincial Authorities.	2002
National Heritage Resources Act, Act No. 25 of 1999	Legislation consulted during the impact assessment process, to determine the legal requirements relating to the management of heritage resources that are present in and around the site.	SAHRA	1999
National Environmental Management: Waste Act, Act No. 59 of 2008, read together with the List of Waste Activities that Have, or are Likely to Have, a Detrimental Effect on the Environment, GN No. 921 of 29 November 2013	Legislation consulted to determine whether a waste licence will have to be obtained for the development.	National & Provincial	2008
National Environmental Management: Air Quality Act (Act 39 of 2004)	To protect the environment by providing reasonable measures for the prevention of pollution and ecological degradation and for securing ecologically sustainable	Relevant Provincial Authorities.	2004

	development while promoting justifiable economic and social Development. Construction activities may cause some air pollution.		
The Conservation of Agricultural Resources Act (Act 43 of 1983)	This Act regulates the flow pattern of runoff water, control of weeds and invader plants.	Relevant Provincial Authorities.	1983
National Veldt and Forest Fire Act (Act 101 of 1998)	Chapter 4 places a duty on owners to prepare and maintain firebreaks.	Relevant Provincial Authorities.	1998
National Forests Act, Act 84 of 1998 (NFA) read with GN 536 of 7 September 2018.	During the construction phase of the development certain protected trees may be affected. Licences will have to be obtained from the Minister before the affected trees may be cut, disturbed, damaged or destroyed. GN 536 of 7 September 2018 contains the list of protected trees.	National and Provincial authorities.	1998
Northern Cape Nature Conservation Act, 2009 (Act. No. 9 of 2009)	This Act contains schedules of protected and specially protected species (fauna and flora) that may not be disturbed without a valid fauna and flora Permit from Nature Conservation.	Northern Cape Provincial Authority.	2009
Occupational Health and Safety Act (Act 85 of 1993)	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 and the protection of persons other than persons at work against hazards to health.	Relevant Provincial Authorities.	1993
National Heritage RESOURCES Act (Act 25 of 1999)	Regulation 38. (1) states that any person who intends to undertake a development categorised as—(a) the construction of a canal exceeding 300m in length; must get authorization from SAHRA	Relevant Provincial Authorities.	1999

ADDITIONAL NATIONAL LEGISLATION

Other National Legislation, which has implications for environmental control on the site, includes:

- *Conservation of Agricultural Resources Act (43 of 1983), regulation of the flow pattern of runoff water, control of weeds and invader plants;*
- *National Environmental Management Waste Act (59 of 2008)*
- *The Guidelines contained in the Document of the Department of Environmental Affairs and Tourism (Department of Environmental Affairs and Tourism, 1998) , regarding the implementation of the regulations under sections 21, 22 and 26 of the above mentioned act*
- *The Guidelines contained in the Document on Integrated Environmental Management (Department of Environmental Affairs, 1992)*
- *The National Heritage Act (25/1999)*
- *Aide Memoir - Department of Water Affairs and Forestry (DWAF, 2003)*
- *Water Act (36/1998)*
- *Water Services Act (108/1997)*

- *Occupational Health and Safety Act, (1993/85)*
- *Mineral and Petroleum Resources Development Act (MPRDA) (Act No. 28 of 2002)*
- *The Mine Health and Safety Act (MHSA) (Act No. 29 of 1996)*
- *National Forest Act (84/1998)*
- *The following municipal policies and documents were consulted:*
 1. *The Integrated Development Plan for Thembelihle Local Municipality;*
 2. *The Spatial Development Framework of Pixley ka Sem District Municipality;*
 3. *The Spatial Planning and Land Use Management Act, Act 16 of 2013;*
 4. *The Municipal Land Use Management Scheme and Land Use By-law;*
 5. *The Local Government Systems Act 2000;*
 1. *“Breaking New Ground” Policy; and*
 2. *Guidelines according to Human Settlement Planning and Design (compiled by the CSIR for the Department of Housing).*

SUSTAINABLE DEVELOPMENT

The principle of Sustainable Development has been established in the Constitution of the Republic of South Africa (108 of 1996) and given effect by NEMA. Section 1(29) of NEMA states that sustainable development means the integration of social, economic and environmental factors into the planning, implementation and decision-making process so as to ensure that development serves present and future generations.

Thus, Sustainable Development requires that:

- *The disturbance of ecosystems and loss of biological diversity are avoided, or, where they cannot be altogether avoided, are minimised and remedied;*
- *That pollution and degradation of the environment are avoided, or, where they cannot be altogether avoided, are minimised and remedied;*
- *That the disturbance of landscapes and sites that constitute the nation’s cultural heritage is avoided, or where it cannot be altogether avoided, is minimised and remedied;*
- *That waste is avoided, or where it cannot be altogether avoided, minimised and re-used or recycled where possible and otherwise disposed of in a responsible manner;*
- *That a risk-averse and cautious approach is applied, which takes into account the limits of current knowledge about the consequences of decisions and actions;*
- *Negative impacts on the environment, on people’s environmental rights be anticipated; and, prevented, and where they cannot altogether be prevented, are minimised and remedied.*

The study is conducted in such a way as to comply with the instructions regarding such studies and reports (as contained within the above-mentioned documents).

5. WASTE, EFFLUENT, EMISSION, NOISE, AND VISUAL IMPACT MANAGEMENT

5.1 Solid waste management

Did/does the activity produce any general waste (e.g. domestic-, commercial-, certain industrial waste, including building rubble also known as solid waste) during the construction phase <u>and/or</u> the operational phase?	YES	NO
If yes, briefly describe what type of waste was produced (i.e. green waste, building rubble, etc.) in which phase.		
Building rubble during the construction phase and domestic waste during the operational phase		
What quantity was/is produced during the construction period?	30	m ³
What was/is the estimated quantity that will be produced per month during the operational phase?	40	m ³
Did/does the activity produce any <u>hazardous</u> waste (e.g. chemical, medical waste, infectious, nuclear etc.) during the construction and/or the operational phase?	YES	NO
If yes, briefly describe what type of waste was produced (i.e. infectious waste, medical waste, etc.) in which phase.		
Where and how was/is waste treated / disposed of (describe each waste stream)?		
Building rubble will be removed by means of trucks to the licensed solid waste site during the construction phase Domestic waste will be collected on a weekly basis by the Local municipality and disposed of at the solid waste disposal site.		
Does/did the activity produce solid waste that was/will be treated and/or disposed of at another facility other than into a municipal waste stream?	YES	NO

5.2 Liquid effluent

Did/does the activity produce sewage and or any other effluent?	YES	NO
What was/is the estimated quantity produced per month?	It is estimated that 44 053.92ℓ of sewage will be generated by the fully developed study area.	
Was/is the effluent treated and/or disposed of in a municipal system?	YES	NO
Was/is any effluent produced be treated and/or disposed of on site?	YES	NO

5.3 Emissions into the atmosphere

Did/does the activity produce emissions that will be disposed of into the atmosphere?	YES	NO
If yes, did/does it require approval in terms of relevant legislation? If yes, attach a copy to this application	YES	NO
Describe the emissions in terms of type and concentration and how it was/will be treated/mitigated:		

5.4 Generation of noise

Will the activity generate noise?	YES	NO
If YES, is it controlled by any legislation of any sphere of government?	YES	NO
If YES, the applicant should consult with the competent authority to determine whether it is necessary to change to an application for scoping and EIA.		
If NO, describe the noise in terms of type and level:		

5.5 Water use

(a) Please indicate the source(s) of water for the activity by crossing out ("X") the appropriate box(es)

Municipal	Water board	Groundwater	River, Stream, Dam or Lake	Other	The activity did/does not use water
------------------	-------------	-------------	----------------------------	-------	-------------------------------------

If water was/is extracted from a groundwater source, river, stream, dam, lake or any other natural feature, please indicate the volume that was/is extracted per month:

m³

Please provide proof of assurance of water supply eg. letter of confirmation from Municipality/water user associations, yield of borehole etc.

Did/does the activity require a water use permit / license from DWAF? If yes, attach a copy to this application

YES

NO

If yes, please submit the necessary application to Department of Water Affairs and Forestry and attach proof thereof to this application.

(b) Describe any mitigation/management measures that were adopted and the adequacy of these:

See paragraph 2.3.2

5.6 Energy efficiency

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

Municipality

Has the Municipality or relevant service provider confirmed that sufficient electricity capacity (i.e. generation, supply and transmission) exist for activity(ies)?

YES

NO

If yes, provide written confirmation from Municipality or relevant service provider.

If power supply was/is not available, where was/is it sourced from?

(b) Describe any mitigation/management measures that were adopted and the adequacy of these:

The Municipality completed the construction and commissioning of the MV Backbone Bulk Line Upgrade project at the end of September 2019. As a result of the completion of the Bulk Line Project, the electrical network now has sufficient capacity to supply the new settlement areas of Goutrou and Hillside. According to the Electrical Services report: Hopetown is currently supplied from their Municipal Main Intake 22/11kV "Ster" Substation which is supplied from the Eskom "Osborne-Waterford" 22kV feeder. The Goutrou development is already serviced and is supplied from the Municipal "Ster" Substation via an 11kV overhead "Hare" line which has adequate capacity for the Goutrou South (Hillside) development. The bulk supply limitations on the Municipal and upstream Eskom network are summarised as follows:

a) The Notified Maximum Demand (NMD) at the Municipal Intake 22/11kV "Ster" Substation is 1,8MVA and is fully utilized. Hence, the NMD must be increased as per the load estimate requirements.

b) The upstream Eskom "Osborne-Waterford" 22kV feeder which supply the Municipal "Ster" Substation has 2MVA spare capacity and could accommodate approximately 800 low-income erven. The installation of a Voltage Regulator on this Eskom feeder will accommodate the proposed development in Goutrou South (Hillside).

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

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

It is likely that solar geysers will be installed.

5.7 Noise Impacts

(a) Did/does the activity result in any noise impacts?

YES

NO

If yes, please describe and indicate the measures implemented to mitigate and manage these impacts?

5.8 Visual impacts

(a) Did/does the activity result in any visual impacts?	YES	NO
If yes, please describe and indicate the measures implemented to mitigate and manage these impacts?		
The formalization of the township will enhance the aesthetics of the area by alleviating the need for informal settlement on the site.		
(b) Did/does the activity result in potential lighting impacts at night?	YES	NO
If yes, please describe and indicate the measures implemented to mitigate and manage these impacts?		
At present, sufficient electricity is not available in the area to have a significant impact. Once formalization has taken place, lighting impacts will occur. No measures have been implemented as this is for a normal residential development.		
(c) Were/are there any alternatives available to address this impact?	YES	NO
If yes, please describe these alternatives?		

6. SITE/AREA/PROPERTY DESCRIPTION

Current land-use zoning as per local municipality IDP/records:

Formal zoning unknown, informal settlement

In instances where there is more than one current land-use zoning, please attach a list of current land use zonings that also indicate which portions each use pertains to, to this application.

Is a change of land-use or a consent use application required?

YES	NO
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6.1 Gradient of the site

Indicate the general gradient of the site.

Ridgeline	Plateau	Side slope of hill/mountain	Closed valley	Open valley	Plain	Undulating plain/low hills	Dune	Sea-front	Other
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6.2 Location in landscape

Indicate the landform(s) that best describes the site:

2.1 Ridgeline	<input type="checkbox"/>	2.4 Closed valley	<input type="checkbox"/>	2.7 Undulating plain / low hills	<input type="checkbox"/>
2.2 Plateau	<input type="checkbox"/>	2.5 Open valley	<input type="checkbox"/>	2.8 Dune	<input type="checkbox"/>
2.3 Side slope of hill/mountain	<input type="checkbox"/>	2.6 Plain	<input checked="" type="checkbox"/>	2.9 Seafront	<input type="checkbox"/>

6.3 Groundwater, Soil and Geological stability of the site

Is the site(s) located on any of the following?

Shallow water table (less than 1.5m deep)	YES	NO	UNSURE
Seasonally wet soils (often close to water bodies)	YES	NO	UNSURE
Unstable rocky slopes or steep slopes with loose soil	YES	NO	UNSURE
Dispersive soils (soils that dissolve in water)	YES	NO	UNSURE
Soils with high clay content	YES	NO	UNSURE
Any other unstable soil or geological feature	YES	NO	UNSURE
An area sensitive to erosion	YES	NO	UNSURE

If any of the answers to the above are “YES” or “UNSURE”, specialist input may be requested by the Department. Information in respect of the above will often be available at the planning sections of local authorities. Where it exists, the 1:50 000 scale Regional Geotechnical Maps prepared by Geological Survey may also be used.

If you are unsure about any of the above or if you are concerned that any of the above aspects may be an issue of concern in the application, an appropriate specialist should be appointed to assist in the completion of this section. Information in respect of the above will often be available as part of the project information or at the planning sections of local authorities. Where it exists, the 1:50 000 scale Regional Geotechnical Maps prepared by the Council for Geo Science may also be consulted.

6.4 Surface water

Indicate the surface water present on and or adjacent to the site and alternative sites (cross out (“X”) the appropriate boxes)?

Perennial River	YES	NO	UNSURE
Non-Perennial River	YES	NO	UNSURE
Permanent Wetland	YES	NO	UNSURE
Seasonal Wetland	YES	NO	UNSURE
Artificial Wetland	YES	NO	UNSURE
Estuarine / Lagoonal wetland	YES	NO	UNSURE

The landscape can be described as gentle undulating topography and low relief. The natural drainage is the area is mainly in a north and north-western direction

6.5 Vegetation and groundcover

6.5.1 Vegetation / Groundcover (Pre-commencement)

Indigenous Vegetation - good condition	X	Indigenous Vegetation with scattered aliens		Indigenous Vegetation with heavy alien infestation	
<p>Describe the vegetation type above:</p> <p>While it cannot be categorically stated that no threatened, near-threatened plant species were found at the site prior to the informal development, there are no distinct indicators that such species would have been at the site.</p> <p>Site is part of the Savanna Biome which is represented by the Kimberley Thornveld vegetation type at the northern parts of the site as well as Northern Upper Karoo at the southern parts of the site (Mucina & Rutherford 2006).</p>					
		Describe the vegetation type above:		Describe the vegetation type above:	

Provide ecosystem status for above: It could be perceived to have been sensitive. The vegetation types at the site are Upper Karoo (NKu 3) and Kimberley Thornveld (SVk 4) which are not listed as threatened according to the National List of Threatened Ecosystems (2011).	Provide ecosystem status for above:	Provide Ecosystem status for above:
Indigenous Vegetation in an ecological corridor or along a soil boundary / interface	Veld dominated by alien species	Distinctive soil conditions (e.g. Sand over shale, quartz patches, limestone, alluvial deposits, termitaria etc.) – describe
Bare soil	Building or other structure	Sport field
Other (describe below)	Cultivated land	Paved surface
Please note: The Department may request specialist input/studies depending on the nature of the vegetation type / groundcover and impact(s) of the activity/ies. To assist with the identification of the <u>vegetation type</u> and <u>ecosystem status</u> consult http://bgis.sanbi.org or BGIShelp@sanbi.org . Information is also available on compact disc (cd) from the Biodiversity-GIS Unit, Ph (021) 799 8698. This information may be updated from time to time and it is the applicant/ EAP's responsibility to ensure that the latest version is used.		

6.5.2. Vegetation / Groundcover (Post-commencement)

Cross out ("☒") the block or describe (where required) the vegetation types / groundcover present on the site after commencement of the activity.

Indigenous Vegetation - good condition		Indigenous Vegetation with scattered aliens		Indigenous Vegetation with heavy alien infestation	X
Describe the vegetation type above:		Describe the vegetation type above:		<p>Describe the vegetation type above:</p> <ul style="list-style-type: none"> Large parts of vegetation at the site have been transformed or modified. Remaining vegetation is mainly karroid with few individual trees. Exotic trees occur at informal residential areas. The aggressive alien invasive tree <i>Prosopis glandulosa</i> is found at various places at the site. Indigenous trees include shrub-height <i>Diospyros lycioides</i> subsp. <i>lycioides</i>, <i>Vachellia tortilis</i>, <i>Ziziphus mucronata</i> and <i>Senegalia mellifera</i> subsp. <i>detinens</i>. The tall shrub <i>Rhigozum trichotomum</i> is found in dense clumps at some places at the site. Other tall shrubs include <i>Lycium cinereum</i> and <i>Lycium horridum</i>. The succulent shrub <i>Hertia</i> 	

		<p><i>pallens</i> is widespread at remaining vegetation at the site. occurs Low shrubs are visibly frequent at remaining vegetation at the site and include <i>Aptosimum marlothii</i>, <i>Pentzia globosa</i>, <i>Chrysocoma ciliata</i>, <i>Gnidia polycephala</i>, <i>Melolobium candicans</i>, <i>Plinthus karoocicus</i>, <i>Pteronia glauca</i>, <i>Selago geniculata</i> and <i>Zygophyllum</i> species. Herbaceous plant species include <i>Gazania krebsiana</i>, <i>Chamaesyce inaequilatera</i>, <i>Hermannia comosa</i>, <i>Indigofera alternans</i>, <i>Sesamum capense</i> and <i>Tribulus terrestris</i>. Indigenous grass species at the site include <i>Eragrostis lehmanniana</i>, <i>Eragrostis echinochloidea</i>, <i>Aristida congesta</i>, <i>Tragus berteronianus</i> and <i>Enneapogon desvauxii</i>.</p> <ul style="list-style-type: none"> Some of the alien invasive weed species at hirtherto bare ground or ecologically disturbed areas at the site are <i>Salsola kali</i>, <i>Argemone ochroleuca</i>, <i>Schkuhria pinnata</i>, <i>Xanthium spinosum</i>, <i>Chenopodium album</i>, <i>Alternanthera pungens</i> and <i>Datura ferox</i>. <p>Informal settlements are present at large parts of the site. Roads, fences and infrastructure associated with informal settlements are found at the site. Informal dumping is widespread and at some places, extensive. Many parts of the site are surrounded by residential areas, roads, scraped areas and fences. Various alien invasive weeds are widespread at the site</p>
Provide ecosystem status for above:	Provide ecosystem status for above:	<p>Provide Ecosystem status for above:</p> <p>Informal buildings, roads, numerous scraped areas and fences are found widespread at the site. Informal dumping occurs at some parts. Various alien invasive weeds are widespread at the site</p>

		<p>Scope for the site to be part of a corridor of particular conservation concern is small</p> <p>The vegetation types at the site are Upper Karoo (NKu 3) and Kimberley Thornveld (SVk 4) which are not listed as threatened according to the National List of Threatened Ecosystems (2011)</p>
Indigenous Vegetation in an ecological corridor or along a soil boundary / interface	Veld dominated by alien species	Distinctive soil conditions (e.g. Sand over shale, quartz patches, limestone, alluvial deposits, termitaria etc.) – describe
Bare soil	Building or other structure	Sport field
Other (describe below)	Cultivated land	Paved surface

6.5.3 Vegetation / Groundcover Management

Describe any mitigation/management measures that were adopted and the adequacy of these:

<ul style="list-style-type: none"> The removal of vegetation takes place at an area of medium/ low ecological sensitivity. If the development is approved, cultivation of indigenous plant species at the site is essential. The scope for the degraded and isolated site to be a corridor of particular conservation importance is small. Cultivation of indigenous plant species at the site is essential and will enhance urban conservation corridors. Continued monitoring and eradication of alien invasive plant species are imperative. It is in particular declared alien invasive species such as <i>Prosopis glandulosa</i> (Mesquite) that should not be allowed to establish.

6.6 Land use character of surrounding area

Cross out (“☒”) the block that reflects the past land uses and/or prominent features that occur/red within +/- 500m radius of the site and neighbouring properties if these are located beyond 500m of the site.

Please note: The Department may request specialist input/studies depending on the nature of the land use character of the area and impact(s) of the activity/ies.

Untransformed area	Low density residential	Medium density residential	High density residential	Informal residential
Retail	Commercial & warehousing	Light industrial	Medium industrial	Heavy industrial
Power station	Office/consulting room		Casino/entertainment complex	Tourism & Hospitality facility

		Military or police base/station/compound		
Open cast mine	Underground mine	Spoil heap or slimes dam	Quarry, sand or borrow pit	Dam or reservoir
Hospital/medical center	School	Tertiary education facility	Church	Old age home
Sewage treatment plant	Train station or shunting yard	Railway line	Major road (4 lanes or more)	Airport
Harbour	Sport facilities	Golf course	Polo fields	Filling station
Landfill or waste treatment site	Plantation	Agriculture	River, stream or wetland	Nature conservation area
Mountain, koppie or ridge	Museum	Historical building	Graveyard	Archaeological site
Other land uses (describe):				

7. CULTURAL/HISTORICAL FEATURES

Were there any signs or evidence (unearthed during construction) of culturally or historically significant elements including archaeological or palaeontological sites, on or in close proximity to the site?		YES	NO
		UNCERTAIN	
If YES, explain:	A graveyard (Site 3) is located outside of the study and development area and is of recent age and origin. The site is very large with an unknown number of graves located on it. Care should be taken to not impact on the site and graves in it in any way during future development actions		
If uncertain, the Department may request that specialist input be provided to establish whether there was such possibilities occurred on or close to the site.			
Briefly explain the findings of the specialist if one was already appointed:	<p>A number of known cultural heritage sites (archaeological and/or historical) exist in the larger geographical area within which the study area falls. There are no known sites on the specific land parcel, while some were identified in the study and surrounding area during the assessment.</p> <p>Two sites with relatively small scatters of Stone Age material were identified and recorded during the assessment. The 2nd site is located close to an old quarry/erosion donga site on the south-eastern edge of the area.</p> <p>In isolation the sites and material recorded are not of high significance as the scatters of Stone Age material is not dense and not in situ. However the possibility of some in situ deposits and sites do exist and the following is therefore recommended:</p>		

	<p>1. that if any in situ deposits of archaeological material is exposed during development activities then an archaeologist should be called in to investigate and recommend on the way forward.</p> <p>The graveyard site (Site 3) is located outside of the study and development area and is of recent age and origin. The site is very large with an unknown number of graves located on it. Care should be taken to not impact on the site and graves in it in any way during future development actions.</p> <p>From a cultural heritage point of view the proposed Goutrou Township Development can therefore continue, taking cognizance of the above recommendations.</p>
Were any buildings or structures older than 60 years be affected in any way?	YES NO
Was it necessary to apply for a permit in terms of the National Heritage Resources Act, 1999 (Act 25 of 1999)?	YES NO
If yes, please submit or, make sure that the applicant or a specialist submit the necessary application to SAHRA or the relevant provincial heritage agency and attach proof thereof to this application.	

8. IMPACT ASSESSMENT

Objective of the environmental impact assessment process

The objective of the environmental impact assessment process is to, through a consultative process-

1. determine the policy and legislative context within which the activity is located and document how the proposed activity complies with and responds to the policy and legislative context;
2. describe the need and desirability of the proposed activity, including the need and desirability of the activity in the context of the development footprint on the approved site as contemplated in the accepted scoping report;
3. identify the location of the development footprint within the approved site as contemplated in the accepted scoping report; based on an impact and risk assessment process inclusive of cumulative impacts and a ranking process of all the identified development footprint alternatives focusing on the geographical, physical, biological, social, economic, heritage and cultural aspects of the environment;
4. determine the –
 - i. nature, significance, consequence, extent, duration and probability of the impacts occurring to inform identified preferred alternatives; and
 - ii. degree to which these impacts-
 - (aa) can be reversed;
 - (bb) may cause irreplaceable loss of resources, and
 - (cc) can be avoided, managed or mitigated;
5. identify the most ideal activity within the development footprint of the approved site as contemplated in the accepted scoping report based on the lowest level of environmental sensitivity identified during the assessment;
6. identify, assess, and rank the impacts the activity will impose on the development footprint on the site as contemplated in the accepted scoping report through the life of the activity;
7. identify suitable measures to avoid, manage or mitigate identified impacts; and identify residual risks that need to be managed and monitored.

Scope of assessment and content of environmental impact assessment reports

The EIA assesses those identified potential environmental impacts and benefits (direct, indirect and cumulative impacts) associated with the project design, construction, and operation phases, and recommends appropriate mitigation measures for potentially significant environmental impacts. The Environmental impacts are assessed both before and after mitigation to determine:

- The significance of the impact despite mitigation; and
- The effectiveness of the proposed mitigation measures.

The EIA addresses potential environmental impacts and benefits associated with all phases of the project, including design, construction and operation, and aims to provide the environmental authorities with sufficient information to make an informed decision regarding the proposed project

Assumptions, uncertainties, limitations and gaps in knowledge

This report is based on current available information and, as a result, the following limitations and assumptions are implicit –

The report is based on the *project description* provided by Maxim Town Planning Solutions as a result of reports that was compiled by the following Specialists:

- A Geotechnical Engineer was appointed to determine whether the Geology and Soils of the site is suitable for the proposed development.
- A Town and Regional Planner designed the proposed development in such a way that the layout of the proposed development, takes into account the measures described by the Civil Engineer and that the layout satisfies the needs of future occupiers of the site.
- The Traffic Engineer evaluated the accesses to the sites and to mitigate the impact that the proposed development may have on existing traffic and road conditions.
- The Civil Engineer was appointed to determine the capability of existing infrastructure to be linked to proposed development and readily available bulk services. He also designed the proposed infrastructure.
- A SAHRA Specialist has been appointed to determine the possible impact of the development on Archaeological and Cultural features.
- An ecologist has been appointed to determine the impact of the proposed development on the Fauna and Flora of the area.
- An Environmental Screening Process was conducted by the EAP to ensure that all the relevant Environmental Legislation is taken into consideration.
- Desk top studies were conducted and alternatives assessed.

Descriptions of the biophysical and social environments are based on specialist fieldwork, investigations, and the Public Participation Process.

8.1 DESCRIPTION OF THE ENVIRONMENT THAT MAY BE AFFECTED BY THE PROJECT

8.1.1 Bio-physical aspects

8.1.1.1 Geology

According to the Geo-Technical report that was compiled for the site, the site is underlain by shale and sandstone of the Ecca Group, Karoo Supergroup, but is locally covered by recent aeolian sand and calcrete gravel of the Kalahari Formation. Some severe problems are foreseen regarding the excavatability to 1,0m depth on site, and shallow rock, core stones and rock outcrop or hard pan calcrete were identified almost across the site.

Zoning of the site revealed zones with minor constraints regarding the **compressibility, collapse potential** and the **expansive potential** of the soil.

The following zones were identified on the site:

Normal Development with risk:

Site Class CR/1A3F:

This zone represents the majority of the area and comprises of a relative thin top layer sand less than 0,75m in thickness of slightly collapsible and compressible or low expansive soil underlain by a competent pebble marker or calcrete, with estimated total movement of less than 7,5mm measured at surface with the risk of shallow rock, core stones and hard pan calcrete rock outcrop adding a **R site class designation** to

the zone with **problems relating to restricted excavation to less than 1,0m**. Development on solid rock calcrete or calcrete rock outcrop known as hard pan calcrete and will have an inflated cost where special pneumatic tools and blasting will be required for the installation of services. Normal foundation techniques will be adequate to enable proper development, with proper compaction within standard strip foundations and drainage provision that will be required. It is classified as HCR in terms of the SAIEG & NHBRC guidelines (1995) or the SAICE Code of practice (1995), and 1A3F according to the classification for urban development (Partridge, Wood & Brink)(1993).

Suitable for development with precaution

Site Class PQ: Areas where small quarries or filling or dumping of spoil were identified must be rehabilitated before any construction can be allowed, and backfilling with an engineer's material may improve the developability of these zones, but these operations will dramatically increase the development cost in this zone.

Normal and special construction techniques will be required to enable proper development. This includes the use of **compaction techniques** and **site drainage** as described

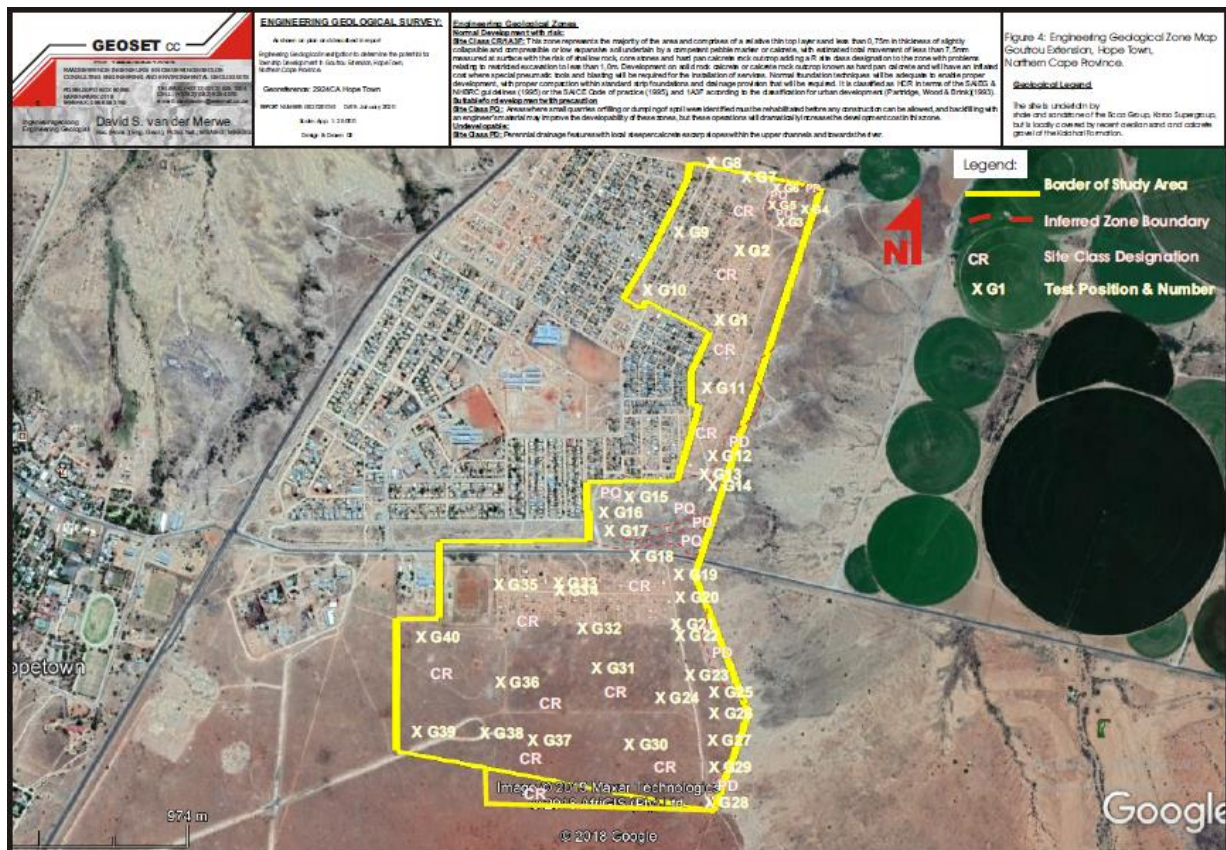


Figure 3: Engineering Geological Zone Map

8.1.1.2 Topography

The topography of the study area is in general flat and open, with no real rocky outcrops or ridges occurring although there are some higher elevated sections. The site is located on a northern slope towards the Orange River from 1085 to 1104 masl.

An old quarry is located towards the south of Goutrou. Most of this quarry has been filled with building rubble and informal dumping.

A detailed site survey has been carried out to establish levels. The Engineering report and the Layout plan will address issues regarding storm water. As the proposed development will be in close proximity to residential areas, safety of children and people need to be taken into consideration during the construction phase.

8.1.1.3 Climate

The region is characterized by summer rainfall with thunderstorms, with annual low rainfall figures of 322 mm for Hopetown recorded at the closest weather stations to the site. Winters are dry with frost common. The warmest months are normally December and January and the coldest months are June and July.

Extreme climatic events may have an influence on the project during the construction and operational phase and will have to be taken into consideration.

Climate Change

According to: WIREs Clim Change 2014, 5605-620. Doi:10.1002/wcc.295: "Climate change is a key concern within South Africa. Mean annual temperatures have increased by at least 1.5 times the observed global average of 0.65°C over the past five decades and extreme rainfall events have increased in frequency. These changes are likely to continue. Climate change poses a significant threat to South Africa's water resources, food security, health, infrastructure, as well as its ecosystem services and biodiversity. Considering South Africa's high levels of poverty and inequality, these impacts pose critical challenges for national development. In relation to water, impact studies for the water resources sector have begun to look beyond changes in streamflow to changes in the timing of flows and the partitioning of streamflow into baseflows and stormflows, reservoir yields, and extreme hydrological events. Spatially the eastern seaboard and central interior of the country are likely to experience increases in water runoff. Higher frequencies of flooding and drought events are projected for the future. Complexities of the hydrological cycle, influences of land use and management and the linkages to society, health, and the economy indicate far higher levels of complexity in the water resources sector than in other sectors. What has emerged is that land uses that currently have significant impacts on catchment water resources will place proportionally greater demands on the catchment's water resources if the climate were to become drier. The influence of climate change on water quality is an emerging research field in South Africa, with assessments limited to water temperature and non-point source nitrogen and phosphorus movement. A critical interaction that has not been explored is between changes in water quality and quantity and the combined impacts, such changes might have impact on various types of water use, e.g., irrigation, domestic consumption, or aquatic ecosystems support".

Water availability and demand has been calculated by the consulting Civil Engineers, to enable a sustainable waterborne sewage system as well as potable water supply for both the existing and future developments in the area

8.1.1.4 Surface drainage

The site is located on a shallow slope towards the Orange River located approximately 1 500 meters north of the site. Plate flow is the dominant drainage pattern on site, and no prominent drainage channel intersects the site. Drainage occurs in a northern eastern direction on site, and then in a northern direction towards and into the Orange River.

Special care must be taken to ensure adequate surface drainage to prevent the accumulation of water next to structures. Storm water diversion measures such as ponding pools are recommended to control peak flows during thunderstorms. All embankments must be adequately compacted and vegetated to stop any excessive erosion and scouring of the landscape.

8.1.1.5 Ground water

The permanent or perched water table on site is deeper than 1,5m below ground surface. Although no seepage or the presence of perennial fluctuations of ground water were not encountered on site, the Engineering Geological report expects that a seasonal perched water table may exist. A calcified profile indicates that some perennial water level fluctuations occur.

Ground water in the form of seepage was not intersected in any test pits during the investigation, but some problems are foreseen and normal water tightening techniques such as damp course on foundation levels are required.

The expected high permeability of the silty sand may lead to leachate from sanitation systems to reach the ground water, and a closed water borne sewage system is recommended.

8.1.1.6 Flora

To serve as local context for the landscape and vegetation at the site an outline of the Kimberley Thornveld (SVk 4) and Northern Upper Karoo (NKu 3) from Mucina and Rutherford (2006) follows.

SVk 4 Kimberley Thornveld

Distribution: In South Africa the Kimberley Thornveld is found in the North West, Free State and Northern Cape Provinces. Kimberley Thornveld is present in most of the Kimberley, Hartswater, Bloemhof and Hoopstad Districts as well as substantial parts of the Warrenton, Christiana, Taung, Boshof and to some extent the Barkly West Districts. The distribution also includes pediment areas in the Herbert and Jacobsdal Districts (Mucina & Rutherford 2006).

Vegetation and landscape features: Plains often slightly irregular with well-developed tree layer of *Acacia erioloba*, *Acacia tortilis*, *Acacia karroo* and *Boscia albitrunca* and well-developed shrub layer with occasional dense stands of *Tarchonanthus camphoratus* and *Acacia mellifera*. Grass layer open with much uncovered soil (Mucina & Rutherford 2006).

Geology and soils: Andesitic lavas of the Allanridge formation in the north and west and fine-grained sediments of the Karoo Supergroup in the south and east. Deep sandy (0.6 – 1.2 m) to loamy soils of the Hutton soil form are present on slightly undulating sandy plains (Mucina & Rutherford).

Climate: Climate is characterized by summer and autumn rainfall and very dry winters. Mean annual precipitation from about 300 mm in the southwest to about 500 mm in the northeast. Frost frequent in winter (Mucina & Rutherford 2006).

Important taxa of the Kimberley Thornveld listed by Mucina & Rutherford (2006): Tall Tree: *Acacia erioloba*. Small Trees: *Acacia karroo*, *Acacia mellifera* subsp. *detinens*, *Acacia tortilis* subsp. *heteracantha*, *Searsia lancea*. Tall Shrubs: *Tarchonanthus camphoratus*, *Diospyros pallens*, *Ehretia rigida*, *Euclea crispa* subsp. *ovata*, *Grewia flava*, *Lycium arenicola*, *Lycium hirsutum*, *Searsia tridactyla*. Low Shrubs: *Acacia hebeclada* subsp. *hebeclada*, *Anthospermum rigidum* subsp. *pumilum*, *Helichrysum zeyheri*, *Hermannia comosa*, *Lycium pilifolium*, *Melolobium microphyllum*, *Pavonia burchellii*, *Peliostomum leucorrhizum*, *Plinthus sericeus*, *Wahlenbergia nodosa*. Succulent Shrubs: *Aloe hereroensis* var. *hereroensis*, *Lycium cinereum*. Graminoids: *Eragrostis lehmanniana*, *Aristida canescens*, *Aristida congesta*, *Aristida mollissima* subsp. *argentea*, *Cymbopogon pospischilii*, *Digitaria argyrograpta*, *Digitaria eriantha* subsp. *eriantha*, *Heteropogon contortus*, *Themeda triandra*. Herbs: *Barleria macrostegia*, *Dicoma schinzii*, *Harpagophytum procumbens* subsp. *procumbens*, *Helichrysum cerastioides*, *Hermbstaedtia odorata*, *Hibiscus marlothianus*, *Jamesbrittenia aurantiaca*, *Lippia scaberrima*, *Osteospermum muricatum*, *Vahlia capensis* subsp. *vulgaris*. Succulent Herbs: *Aloe grandidentata*, *Piранthus decipiens*.

Northern Upper Karoo (NKu 3)

Distribution: Northern Upper Karoo is found in South Africa in the Northern Cape and Free State Provinces. Northern Upper Karoo occurs at the northern regions of the Upper Karoo plateau and ranges from Prieska, Vosburg and Carnarvon in the west to Phillipstown, Petrusville and Petrusburg in the east. Northern Upper Karoo is bordered in the north by Niekerkshoop, Douglas and Petrusburg and in the south by Carnarvon, Pampoenpoort and De Aar. A few patches occur in Griqualand West. Altitude varies mostly from 1000 – 1500 m (Mucina & Rutherford, 2006).

Vegetation and landscape features: Shrubland dominated by dwarf karoo shrubs, grasses and *Acacia mellifera* subsp. *detinens* and some other low trees (especially on sandy soils in the northern parts and vicinity of the Orange River). Flat to gently sloping, with isolated hills of Upper Karoo Hardeveld in the south and Vaalbos Rocky Shrubland in the northeast and with many interspersed pans (Mucina & Rutherford 2006).

Geology and soils: Shales of the Volksrust Formation and to a lesser extent the Prince Albert Formation (both of the Ecca Group) as well as Dwyka Group diamictites from the underlying geology. Jurassic Karoo Dolerite sills and sheets support this vegetation complex in places. Wide stretches of land are covered by superficial deposits including calcretes of the Kalahari Group. Soils are variable from the shallow to deep, red-yellow, apedal, freely drained soils to very shallow Glenrosa and Mispah forms. Mainly Ae, Ag and Fc land types (Mucina & Rutherford, 2006).

Climate: Rainfall peaks in autumn (March). Mean annual precipitation (MAP) ranges from about 190 mm in the west to 400 mm in the northeast (Mucina & Rutherford, 2006).

Important taxa of the Northern Upper Karoo listed by Mucina & Rutherford (2006): Small Trees: *Acacia mellifera* subsp. *detinens*, *Boscia albitrunca*. Tall Shrubs: *Lycium cinereum*, *Lycium horridum*, *Lycium oxycarpum*, *Lycium schizocalyx*, *Rhigozum trichotomum*. Low Shrubs: *Chrysocoma ciliata*, *Gnidia polycephala*, *Pentzia calcarea*, *Pentzia globosa*, *Pentzia incana*, *Pentzia spinescens*, *Rosenia humilus*, *Amphiglossa triflora*, *Aptosimum marlothii*, *Aptosimum spinescens*, *Asparagus glaucus*, *Barleria rigida*, *Berkheya annectens*, *Eriocephalus ericoides* subsp. *ericoides*, *Eriocephalus glandulosus*, *Eriocephalus spinescens*, *Euryops asparagoides*, *Felicia muricata*, *Helichrysum lucilioides*, *Hermannia spinosa*, *Leucas capensis*, *Limeum aethiopicum*, *Melolobium candicans*, *Microlooma armatum*, *Osteospermum leptolobum*, *Osteospermum spinescens*, *Pegolettia retrofracta*, *Pentzia lanata*, *Phyllanthus maderaspatensis*, *Plinthus karooicus*, *Pteronia glauca*, *Pteronia sordida*, *Selago geniculata*, *Selago saxatilis*, *Tetragonia arbuscula*, *Zygophyllum lichtensteinianum*. Succulent Shrubs: *Hertia pallens*, *Salsola calluna*, *Salsola glabrescens*, *Salsola rabieana*, *Salsola tuberculata*, *Zygophyllum flexuosum*. Semiparasitic Shrub: *Thesium hystrix*. Herbs: *Chamaesyce inaequilatera*, *Convolvulus sagittatus*, *Dicoma capensis*, *Gazania krebsiana*, *Hermannia comosa*, *Indigofera alternans*, *Lessertia pauciflora*, *Radyera urens*, *Sesamum capense*, *Sutera pinnatifida*, *Tribulus terrestris*, *Vahlia capensis*. Succulent Herb: *Psilocaulon coriarium*. Geophytic Herb: *Moraea pallida*. Graminoids: *Aristida adscensionis*, *Aristida congesta*, *Aristida diffusa*, *Enneapogon desvauxii*, *Eragrostis lehmanniana*, *Eragrostis obtusa*, *Eragrostis truncata*, *Sporobolus fimbriatus*, *Stipagrostis obtusa*, *Eragrostis bicolor*, *Eragrostis parosa*, *Fingerhuthia africana*, *Heteropogon contortus*, *Stipagrostis ciliata*, *Themeda triandra*, *Tragus berteronianus*, *Tragus koelerioides*, *Tragus racemosa*.

Note: Though some plant species of the above listed vegetation types are present at the site, not necessarily all of the plant species listed above are present at the site.

Large parts of vegetation at the site have been transformed or modified. Remaining vegetation is mainly karroid with few individual trees. Exotic trees occur at informal residential areas. The aggressive alien invasive tree *Prosopis glandulosa* is found at various places at the site. See Photograph 6. Indigenous trees include shrub-height *Diospyros lycioides* subsp. *lycioides*, *Vachellia tortilis*, *Ziziphus mucronata* and *Senegalia mellifera* subsp. *detinens*.



Photograph 6: Small tree in picture is aggressive alien invasive species *Prosopis glandulosa* (Mesquite), at the site.

Photo: R.F. Terblanche

The tall shrub *Rhigozum trichotomum* is found in dense clumps at some places at the site. Other tall shrubs include *Lycium cinereum* and *Lycium horridum*. The succulent shrub *Hertia pallens* is widespread at remaining vegetation at the site. occurs Low shrubs are visibly frequent at remaining vegetation at the site and include *Aptosimum marlothii*, *Pentzia globosa*, *Chrysocoma ciliata*, *Gnidia polycephala*, *Melolobium candicans*, *Plinthus karooicus*, *Pteronia glauca*, *Selago geniculata* and *Zygophyllum* species. Herbaceous plant species include *Gazania krebsiana*, *Chamaesyce inaequilatera*, *Hermannia comosa*, *Indigofera alternans*, *Sesamum capense* and *Tribulus terrestris*. Indigenous grass species at the site include *Eragrostis lehmanniana*, *Eragrostis echinocloidea*, *Aristida congesta*, *Tragus berteronianus* and *Enneapogon desvauxii*.

Some of the alien invasive weed species at hirtherto bare ground or ecologically disturbed areas at the site are *Salsola kali*, *Argemone ochroleuca*, *Schkuhria pinnata*, *Xanthium spinosum*, *Chenopodium album*, *Alternanthera pungens* and *Datura ferox*.

Scope for the site to be part of a corridor of particular conservation concern is small. The Habitat Specialist has compiled the following sensitivity map.

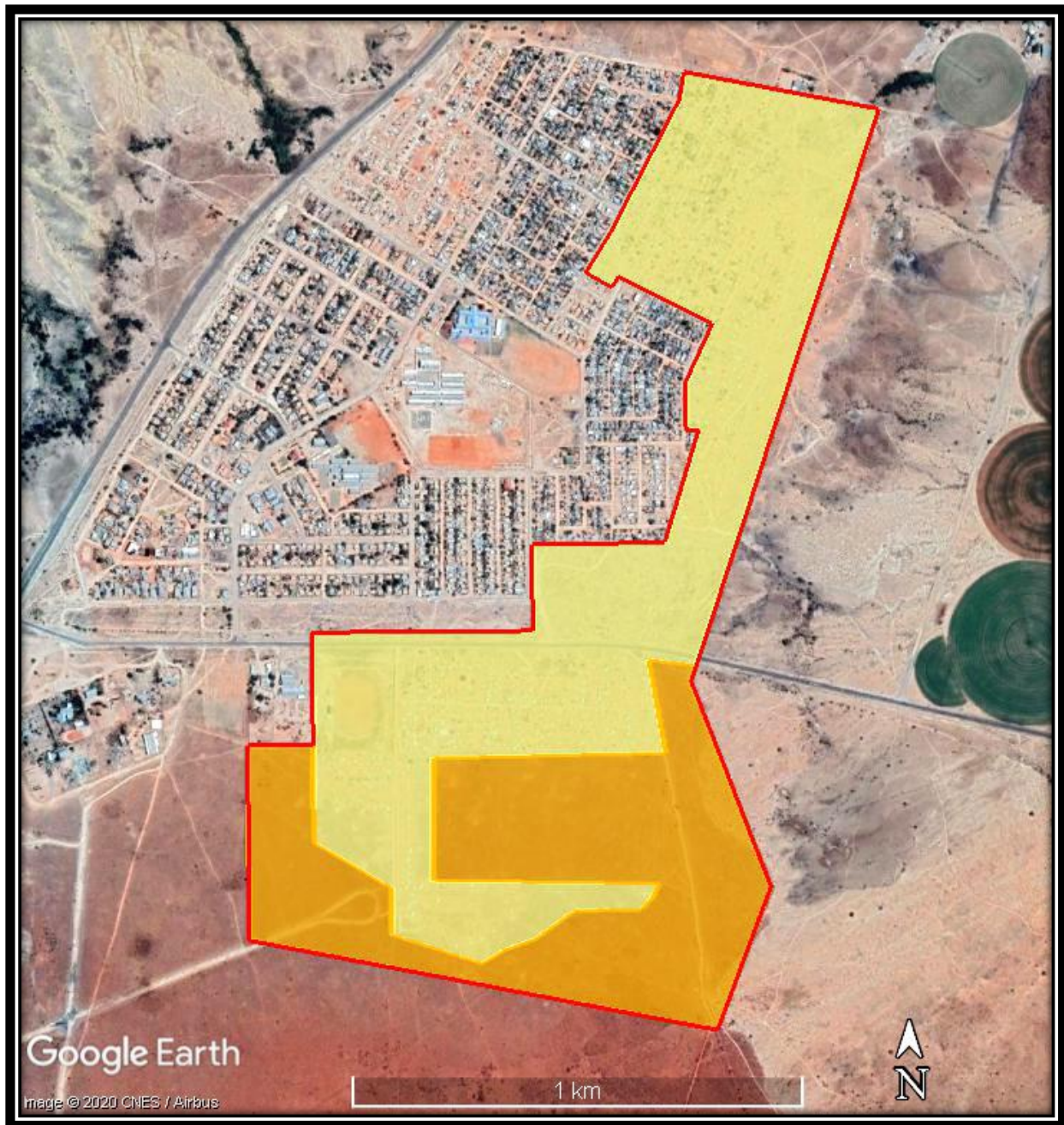


Figure 4: Sensitivity map.

- | | |
|--|------------------------|
| — Red outline | Boundaries of the site |
| — Orange-brown outline and shading | Medium Sensitivity |
| — Light yellow outline and shading | Low Sensitivity |

Ecological sensitivity at most of the is currently low. Ecological sensitivity at vegetation that remains at the site is medium. In the recent past **before informal settlements** were constructed the ecological sensitivity of the entire site, based on habitat at and in the vicinity of the site, was probably medium.

8.1.1.7 Fauna

The fauna of the area is highly disturbed by the people living in the adjoining suburbs. The likelihood of the presence of larger mammals is doubtful. No listed species were identified during the fieldwork phase.

VERTEBRATES

Mammals

Since the site falls outside reserves, threatened species such as the black rhinoceros (*Diceros bicornis*) and the African wild dog (*Lycaon pictus*) are obviously not present. No smaller mammals of particular high conservation significance are likely to be found on the site as well.

Birds

With bird species which often have a large distributional range, their presence does not imply that they are particularly dependent on a site as breeding location. Therefore the emphasis in the right hand columns of. Literature sources that were mainly consulted are Barnes (2000), Hockey, Dean & Ryan, P.G. (2005) and Chittenden (2007). No threat to any threatened bird species or any bird species of particular conservation importance are foreseen.

Reptiles

The Atlas and Red List of Reptiles of South Africa, Lesotho and South Africa (Bates, Branch, Bauer, Burger, Marais, Alexander & de Villiers, 2014) has been used as the main source to compile the list for assessment.

There appears to be no threat to any reptile species of particular high conservation importance if the site is developed.

Amphibians

There is no suitable habitat for *Pyxicephalus adspersus* (Giant Bullfrog) at the site. There appears to be no threat to any amphibian species of particular high conservation importance if the site is developed.

INVERTEBRATES

Butterflies

Studies relating to the vegetation and habitat of threatened butterfly species in South Africa showed that ecosystems with a unique combination of features are selected by these often localised threatened butterfly species (Deutschländer and Bredenkamp 1999; Edge 2002, 2005; Terblanche, Morgenthal & Cilliers 2003; Lubke, Hoare, Victor & Ketelaar 2003; Edge, Cilliers & Terblanche, 2008). Threatened butterfly species in South Africa can then be regarded as bio-indicators of rare ecosystems.

Four species of butterfly in Gauteng Province, northeastern Northern Cape Province and North West Province combined are listed as threatened in the recent butterfly conservation assessment of South Africa (Mecenero *et al.*, 2013). The expected presence or not of these threatened butterfly species as well as species of high conservation priority that are not threatened, at the site.

Assessment of threatened butterfly species

Aloeides dentatis dentatis (Roodepoort Russet)

The proposed global red list status for *Aloeides dentatis dentatis* according to the most recent IUCN criteria and categories is Endangered (Mecenero *et al.*, 2013). *Aloeides dentatis dentatis* colonies are found where one of its host plants *Hermannia depressa* or *Lotononis eriantha* is present. Larval ant

association is with *Lepisiota capensis* (S.F. Henning 1983; S.F. Henning & G.A. Henning 1989). The habitat requirements of *Aloeides dentatis dentatis* are complex and not fully understood yet. See Deutschländer and Bredenkamp (1999) for the description of the vegetation and habitat characteristics of one locality of *Aloeides dentatis* subsp. *dentatis* at Ruimsig, Roodepoort, Gauteng Province. There is not an ideal habitat of *Aloeides dentatis* subsp. *dentatis* on the site and it is unlikely that the butterfly is present at the site.

***Anthene lindae* (Kalahari Hairtail)**

Small but distinct butterfly species discovered by R.F. Terblanche in 1990 at the present Witsand Nature Reserve in the Northern Cape. Recent red listing and extinction risk assessments list *Anthene lindae* as Vulnerable (Henning, Terblanche & Ball, 2009; Mecenero *et al.*, 2013). The butterfly is intimately associated with *Acacia erioloba* which may prove to be the larval food plant (Terblanche, 1994; Jessnitz pers. comm). However, all the localities for this butterfly species have been found on what appears to be a unique catchment area and basins with particular high water tables on the western side of the Langberg mountain chain, Northern Cape Province (Terblanche & Taylor, 2000). According to Henning *et al.* (2009) *Anthene lindae* has up to date only been found at an ecotone between Gordonias Plains Shrubland and Olifantshoek Plains Thornveld (Mucina & Rutherford, 2006). *Anthene lindae* is not found everywhere where *Vachellia erioloba* is present (Terblanche In prep.) and based on the present knowledge and surveys, presence of the butterfly at the site is unlikely.

***Chrysoritis aureus* (Golden Opal/ Heidelberg Copper)**

The proposed global red list status for *Chrysoritis aureus* according to the most recent IUCN criteria and categories is Endangered (Mecenero *et al.*, 2013) *Chrysoritis aureus* (Golden Opal/ Heidelberg Copper) is a resident where the larval host plant, *Clutia pulchella* is present. However, the distribution of the butterfly is much more restricted than that of the larval host plant (S.F. Henning 1983; Terblanche, Morgenthal & Cilliers 2003). One of the reasons for the localised distribution of *Chrysoritis aureus* is that a specific host ant *Crematogaster liengmei* must also be present at the habitat. Fire appears to be an essential factor for the maintenance of suitable habitat (Terblanche, Morgenthal & Cilliers 2003). Research revealed that *Chrysoritis aureus* (Golden Opal/ Heidelberg Copper) has very specific habitat requirements, which include rocky ridges with a steep slope and a southern aspect (Terblanche, Morgenthal & Cilliers 2003). Owing to a lack of habitat requirements and ideal habitat the presence of the taxon is highly unlikely.

***Lepidochrysops praeterita* (Highveld Blue)**

The proposed global red list status for *Lepidochrysops praeterita* according to the most recent IUCN criteria and categories is Endangered (G.A. Henning, Terblanche & Ball, 2009; Mecenero *et al.*, 2013). *Lepidochrysops praeterita* is a butterfly that occurs where the larval host plant *Ocimum obovatum* (= *Becium obovatum*) is present (Pringle, G.A. Henning & Ball, 1994), but the distribution of the butterfly is much more restricted than the distribution of the host plant. *Lepidochrysops praeterita* is found on selected rocky ridges and rocky hillsides in parts of Gauteng, the extreme northern Free State and the south-eastern Gauteng Province. No ideal habitat appears to be present for the butterfly on the site. It is unlikely that *Lepidochrysops praeterita* would be present on the site and at the footprint proposed for the development.

***Orachrysops mijburghi* (Mijburgh's Blue)**

The proposed global red status for *Orachrysops mijburghi* according to the most recent IUCN criteria and categories is Endangered (Mecenero *et al.*, 2013). *Orachrysops mijburghi* favours grassland depressions where specific *Indigofera* plant species occur (Terblanche & Edge 2007). The Heilbron population of *Orachrysops mijburghi* in the Free State uses *Indigofera evansiana* as a larval host plant (Edge, 2005) while the Suikerbosrand population in Gauteng uses *Indigofera dimidiata* as a larval host plant

(Terblanche & Edge 2007). There is no suitable habitat for *Orachrysops mijburghi* on the site and it is unlikely that *Orachrysops mijburghi* would be present on the site.

Conclusion on threatened butterfly species

There appears to be no threat to any threatened butterfly species if the site is developed.

Assessment of butterfly species that are not threatened but also of high conservation priority

***Colotis celimene amina* (Lilac tip)**

Colotis celimene amina is listed as Rare (Low density) by Mecenero et al. (2013). In South Africa *Colotis celimene amina* is present from Pietermaritzburg in the south and northwards into parts of Kwa-Zulu Natal, Gauteng, Limpopo, Mpumalanga and the North West Provinces (Mecenero et al. In press.). Reasons for its rarity are poorly understood. It is highly unlikely that *Colotis celimene amina* would be present at the site.

***Lepidochrysops procera* (Savanna Blue)**

Lepidochrysops procera is listed as Rare (Habitat specialist) by Mecenero et al. (2013). *Lepidochrysops procera* is endemic to South Africa and found in Gauteng, KwaZulu-Natal, Mpumalanga and North West (Mecenero et al., 2013). Owing to a lack of habitat requirements and ideal habitat the presence of the taxon at the site is highly unlikely.

***Metisella meninx* (Marsh Sylph)**

Henning and Henning (1989) in the first South African Red Data Book of Butterflies, listed *Metisella meninx* as threatened under the former IUCN category Indeterminate. Even earlier in the 20th century Swanepoel (1953) raised concern about vanishing wetlands leading to habitat loss and loss of populations of *Metisella meninx*. According to the second South African Red Data Book of butterflies (Henning, Terblanche & Ball, 2009) the proposed global red list status of *Metisella meninx* has been Vulnerable. During a recent large scale atlassing project the Conservation Assessment of Butterflies of South Africa, Lesotho and Swaziland: Red List and Atlas (Mecenero et al., 2013) it was found that more *Metisella meninx* populations are present than thought before. Based on this valid new information, the conservation status of *Metisella meninx* is now regarded as Rare (Habitat specialist) (Mecenero et al., 2013). Though *Metisella meninx* is more widespread and less threatened than perceived before, it should be regarded as a localised rare habitat specialist of conservation priority, which is dependent on wetlands with suitable patches of grass at wetlands (Terblanche In prep.). Another important factor to keep in mind for the conservation of *Metisella meninx* is that based on very recent discoveries of new taxa in the group the present *Metisella meninx* is species complex consisting of at least three taxa (Terblanche In prep., Terblanche & Henning In prep.). The ideal habitat of *Metisella meninx* is treeless marshy areas where *Leersia hexandra* (rice grass) is abundant (Terblanche In prep.). The larval host plant of *Metisella meninx* is wild rice grass, *Leersia hexandra* (G.A. Henning & Roos, 2001). Owing to a lack of habitat requirements and ideal habitat the presence of the taxon at the site is highly unlikely.

***Platylesches dolomitica* (Hilltop Hopper)**

Platylesches dolomitica is listed as Rare (Low density) by Mecenero et al. (2013). Historically the conservation status of *Platylesches dolomitica* was proposed to be Vulnerable (Henning, Terblanche & Ball 2009). However this butterfly which is easily overlooked and has a wider distribution than perceived before. *Platylesches dolomitica* has a patchy distribution and is found on rocky ledges where *Parinari capensis* occurs, between 1300 m and 1800m (Mecenero et al. 2013, Dobson Pers comm.). Owing to a lack of habitat requirements and ideal habitat the presence of the taxon at the site is highly unlikely.

8.1.2 Socio economic factors

8.1.2.1 Social amenities

Informal settlement has already taken place on site, as such the need for housing in the area is highlighted. As in the rest of South Africa, there is a housing shortage in the area. This is undesirable as Informal settlements consist of non-conventional housing built without complying with legal building procedures. Broadly, these crude dwellings mostly lack proper indoor infrastructure, such as water supply, sanitation, drainage, waste disposal and proper road access. There is also a bond between poor housing and environmental conditions in informal settlements which also reflects poverty.

Linking basic services such as water to health is viewed as a false separation as these services are 'intimately related to housing'. It becomes a housing issue if children playing outside the house contract diarrhea via ingesting pathogens from fecal matter which contaminates the land on which they play. Otherwise, it is the house which provides for shelter against injury, weather and disease. Improving the surroundings of the house is to limit severe health risks existing within poor quality housing.

The proposed development is to formalize a township and to provide the services associated with a town to people in the area. It was envisioned to develop the proposed town as early as 2014. A business plan for the two development sites have been prepared in 2014 but was never submitted to COGHSTA. It is evident that from 2013 the area has seen an influx of informal settlements. The occurrence of informal housing in the Municipality can be linked to an increase in urban population and the lack of properly planned sites with infrastructure. The formalization of the town is highly desirable as it will eliminate the negatives associated with informal housing as described above.

The preparation, submission and approval of the business plan to COGHSTA should be seen against the following background that highlights the need and desirability of the development:

- A constant increasing demand for affordable housing within the municipal area;
- The impact of the housing demand on municipal services and land needed therefore;
- The implementation of a well-structured and designed town planning and survey procedure;
- The poor financial and institutional capacity of the Local Authority to proceed with such planning and survey exercises;
- Conducting of a properly structured public participation process; and
- The shortage of funding and budget constraints within the municipal budget to drive such a process and the payment, therefore

Housing Needs

There is no formal updated housing waiting list available at the municipality. Some existing data has however been identified to assist in this regard.

The housing backlog for Hopetown is **1202 housing units**, with a housing supply of zero, according to the Pixley ka Seme District Municipality: Human Settlement Sector Plan and the Thembelihle IDP 2015/2016, this number may be outdated as there seems to be no updated figure in regard to housing backlog in the Municipality.

The above mentioned statistics should be viewed against the fact that the driving factor behind the increased need for housing in Thembelihle Local Municipality is the in-migration of rural households into the urban centres of the municipality, in seek of improved economic opportunities, access to better facilities and improved services.

The proposed development will:

- Provide services associated with the formalization of a town to future occupiers as well as the residents of the neighboring areas.
- During the construction phase of the proposed development, employment opportunities will be created and thus decrease the unemployment rate of the area.
- During the operational phase of the proposed development, additional employment opportunities will be created.
- The tax base of the Thembelihle Local Municipality will be broadened.

8.1.2.2. Air quality

“The extent and toxicity of emissions is not necessarily a concise indicator of contributions to ground-level air pollution concentrations or of risks to health and the environment. Such contributions are also a function of the height of emission, temporal variations in the release of pollutants, and the proximity of the source to the people or the environment affected by exposure to the pollutant (such as, for instance, children, or the elderly, or people who are ill, or others who may be particularly sensitive receptors to a specific pollutant above a certain concentration). If an industry is operating close to a school or hospital or centre for the elderly, the potential exposure (in combination with the other contributing factors) is high.

Three factors govern the significance of household fuel-burning emissions:

- (i) the low level of emissions (that is, their height above the ground is generally about 3 m, within people’s breathing zone);
- (ii) the simultaneous occurrence of peak emissions (during the coldest months of winter and in the early mornings and throughout the evenings) and poor atmospheric dispersion (stable atmosphere with low wind speeds, with the possible development of temperature inversions); and
- (iii) the release of such emissions within high human exposure areas, given that such emissions generally occur in dense, low-income settlements where population density is high (in addition, the pollution is not only outdoors, but frequently indoors as well, due to poor ventilation, so it affects the whole family).

The significance of vehicle emissions as contributors to air-pollutant concentrations and health risks is similarly increased by the low level (close to the ground) of the emissions, and their proximity to highly populated areas – on highways, for example, with emissions being particularly high when traffic is congested. Vehicle emissions tend to peak early in the morning and in the evenings, when the potential for atmospheric dispersion is reduced (for example, wind speeds are generally low in the early mornings and evenings, reducing their potential for dispersing pollution).

Ranking the significance of different sources of pollution on the basis of the total emissions for which each source is responsible would, for example, place industrial emissions above household fuel-burning. If the aim is to reduce impacts on human health, however, then household fuel-burning would need to be targeted as a top priority (Scorgie et al., 2004d).

Historically, air pollution control in South Africa has primarily emphasized the implementation of ‘command and control’ measures in the industrial sector. The shift from source-based control, to the management of the air that people breathe, emphasizes the importance of targeting a wider range of sources and using more flexible and varied approaches. It means paying greater attention to ambient air quality, as it is more important (and more cost-effective, in many cases) to make sure that the ambient

air complies with air quality standards. This approach ensures that human and environmental health is protected and that the cumulative impact of pollution from a number of sources is addressed.

Approaches adopted or considered for future implementation have included: regulation (for example, the use of Atmospheric Emission Licences for Listed Activities); market instruments (such as atmospheric user-charges and pollution taxes); the potential for voluntary agreements, education and awareness raising; and emissions trading. International experience shows that adopting a mix of instruments and interventions is more effective than using a single instrument to improve air quality across various types of source. Although direct regulation remains important in controlling industrial sources, there is evidence that specifying emission limits is more effective than specifying the use of particular technologies, so as to give companies flexibility in selecting the method of achieving success that suits them best. This approach is advocated as being more cost-effective and more likely to stimulate technological advances in pollution control methods and production processes.

For large point sources (that is, sources of pollution that are concentrated on one site, but that have large, constant volumes of many types of pollution) that are few in number, instruments such as emissions trading have been advocated as an effective way to manage pollutant emissions and reduce the costs of compliance.

Implementing an efficient social protection system to alleviate poverty is central to maintaining conditions that facilitate not only economic growth but also environmental sustainability. Many South African households – including those with access to electricity – use coal, wood, and paraffin, due to the relative cost-effectiveness of such fuels for heating (that is, space heating) and cooking purposes.

Many low-cost housing developments and informal settlements are located close to industrial and mining operations, as such land is both available and inexpensive. Poorer communities are more likely to suffer from poor service delivery, including inadequate waste removal that sometimes results in refuse being set alight illegally. These examples show that poverty alleviation could help to improve air quality by enabling people to choose practices that are friendlier to the environment.”

https://www.environment.gov.za/sites/default/files/docs/stateofair_airqualityand_sustainable_development.pdf Date visited: 17/03/2020.

The proposed development is planned and will eventually be developed with the above mentioned in mind. The alleviation of poverty (jobs that will be created) and the provision of proper accommodation facilities (which has been designed to be as energy efficient as possible) will contribute towards lessening air pollution in the area.

In addition to the above, it should be noted that the project will however create a certain amount of dust during the construction phase. If proper dust suppression measures are implemented this variable will have very little impact (low in intensity and significance during the construction phase).

8.1.2.3 Noise

It is a fact that a certain amount of noise will be generated during the construction phase of the project. Noise levels should however rarely exceed the allowable limits. It is unlikely that the project will create any more noise during the operational phase than that already experienced on site.

8.1.2.4 Archaeology and cultural sites

A number of known cultural heritage sites (archaeological and/or historical) exist in the larger geographical area within which the study area falls. There are no known sites on the specific land parcel, while some were identified in the study and surrounding area during the assessment.

Two sites with relatively small scatters of Stone Age material were identified and recorded during the assessment. The 2nd site is located close to an old quarry/erosion donga site on the south-eastern edge of the area.

In isolation the sites and material recorded are not of high significance as the scatters of Stone Age material is not dense and not in situ. However the possibility of some in situ deposits and sites do exist and the following is therefore recommended:

- That if any in situ deposits of archaeological material is exposed during development activities then an archaeologist should be called in to investigate and recommend on the way forward.
- The graveyard site (Site 3) is located outside of the study and development area and is of recent age and origin. The site is very large with an unknown number of graves located on it. Care should be taken to not impact on the site and graves in it in any way during future development actions.

From a cultural heritage point of view the proposed Development can therefore continue, taking cognizance of the above recommendations.

8.1.2.6 Aesthetics

The topography of the study area is in general flat and open, with no real rocky outcrops or ridges occurring although there are some higher elevated sections. Vegetation cover was not dense (grass cover) while tree cover is very limited. The largest part of the study area has been extensively disturbed and developed through informal and more formal residential settlement. Some areas has been heavily disturbed through quarrying and trenching, while informal dumping of residential refuse and building rubble also occurs throughout the area.

Visual Intrusion is defined as the level of compatibility or congruence of the project with the particular qualities of the area, or its 'sense of place'. This is related to the idea of context and maintaining the integrity of the landscape or townscape.

High visual intrusion – results in a noticeable change or is discordant with the surroundings;

Moderate visual intrusion – partially fits into the surroundings, but clearly noticeable;

Low visual intrusion – minimal change or blends in well with the surroundings.

The proposed development will change the scenic resources of the local area from an informal residential area site to a formal residential area. The visual intrusion is considered to be low as the proposed development will have minimal change and blends in well with the surroundings.

The proposed development will require additional lighting on and in buildings and possibly along roads. This will change the night landscape from unlit to lit.

Aesthetics have very little influence as the area is already highly disturbed. The project on the other hand will have a positive impact on the Aesthetics of the area as the informal settlement will be formalized and services will be provided.

8.2 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

Provide a summary and anticipated significance of the potential direct, indirect and cumulative impacts that are likely to occur as a result of the planning and design phase, construction phase, operational phase, decommissioning and closure phase, as well as the mitigation measures that may eliminate or reduce the potential impacts listed (Full impact statement is provided as Appendix H).

Activity	Impact summary	Significance	Proposed mitigation
The commencement of the clearance of 102.3852 ha of indigenous vegetation in order to formalise a township, currently known as the informal settlements of Goutrou and Hillside, situated on a Portion of the Remaining Extent of Erf 1, Hopetown	Direct impacts:		
	102.3852 hectares of indigenous vegetation has been cleared	Medium	Exotic and invasive plant species should not be allowed to establish, if the development is approved.
	Un-rehabilitated, disturbed surfaces can lead to erosion and dust pollution.	Medium	Start the rehabilitation of disturbed surfaces as soon as possible. Spray bare surfaces with water to prevent dust pollution.
	Foreign plant species are likely to invade disturbed areas.	Medium	Start the extermination of any invasive species as soon as possible and maintain the eradication program.
	Poorly planned ablution facilities for construction workers may cause pollution of surface and underground water.	Medium	Provide portable ablution facilities that will not cause pollution during the construction phase.
	The proposed project can impact on the soil and geology.	Medium	Geological instability has been determined by an Engineering Geologist. Properly plan the construction phase in such a manner that impacts on the soil and geology of the area can be minimized. Plan foundations and structures in such a manner that no erosion can take place. No concentrated flow into the receiving environment is

			<p>allowed. Water dispersal structures must be planned to ensure safe dispersal of floodwater.</p> <p>Plan to prevent spills of lubricants/oils that can take place on bare soil. This will include the use of drip trays for stationary vehicles (more than 24 hours).</p>
	<p>The vegetation of the area have been removed which have destroyed floral and faunal habitats.</p>	<i>Medium</i>	<p>Start with the rehabilitation of vegetation to minimize the negative effects of the removal of plants.</p> <p>The rule must be to minimize the disturbance of animal life by keeping the footprint as small as possible.</p> <p>No snares may be set.</p>
Indirect impacts:			
	<p>Dust generation from the proposed project could impact on the surrounding area.</p>	<i>Medium</i>	<p>Spray water on open surfaces to ensure that dust does not cause air pollution during construction.</p> <p>Start the rehabilitation of disturbed surfaces as soon as possible</p>
	<p>Spills of lubricants / oils can take place on bare soil.</p>	<i>Medium</i>	<p>Prevent spills of lubricants/oils that can take place on bare soil. This will include the use of drip trays for vehicles that are standing for more than 24 hours.</p> <p>Ensure that all construction vehicles are in good working order and not leaking oil and or fuel.</p>
	<p>Waste materials such as glass, plastic, metal or paper present a possible pollution hazard</p>	<i>Medium</i>	<p>Implement the management plan to ensure that:</p> <ul style="list-style-type: none"> • All construction rubble is disposed of in a safe and environmentally acceptable manner.

			<ul style="list-style-type: none"> • NO concrete, gravel or other rubbish will be allowed to remain on site after the construction phase. • All cement is housed as to prevent spills (due to rain and or handling errors). • NO glass, plastic, metal, or paper shall be allowed to pollute the area.
	Non-compliance to the relevant legislation may cause social and environmental problems.	<i>Medium</i>	<p>Ensure that contractors (construction phase) abide by all the requirements of the Occupational Health and Safety Act.</p> <p>Ensure that all contractors are aware of the consequences of non-compliance to the relevant legislation regarding the above-mentioned act as well as with regard to the environment (acts, regulations, and special guidelines).</p>
	<p>New employment opportunities will be created.</p> <p>Local skills development will take place.</p>	<i>Medium</i>	No mitigation measures needed apart from the fact that contractors will have to ensure that they abide to the requirements of the Occupational Health and Safety Act and the Employment Equity Act.
	Cumulative impacts:		
	<u>Solid waste:</u> The proposed development will add additional solid waste into the existing waste stream of the area.	<i>Medium</i>	A Civil Engineer has been appointed and will assess the availability and design of services to ensure a sustainable development.
	<u>Sewage:</u> The proposed development will add additional sewage into the existing sewage stream of the area.	<i>Medium</i>	
	<u>Water supply:</u> The proposed development will add pressure to the water supply of the area.	<i>Medium</i>	
	<u>Electricity Supply:</u> The proposed development will add	<i>Medium</i>	

	pressure to the supply of electricity to the area		
	<u>Broadened tax base:</u> The proposed development will generate more income for the Local Municipality.	<i>High</i>	No mitigation required
	<u>Employment:</u> The proposed development will lessen the unemployment rate of the area.	<i>High</i>	No mitigation required

9. ENVIRONMENTAL IMPACT STATEMENT

Taking the assessment of potential impacts into account, please provide an environmental impact statement that summarises the impact that the proposed activity and its alternatives may have on the environment after the management and mitigation of impacts have been taken into account, with specific reference to types of impact, duration of impacts, likelihood of potential impacts actually occurring and the significance of impacts.

9.1 GEOLOGY

GEOLOGY - POSSIBLE IMPACTS (TYPE)

- ◆ The Geology of the area may have some negative impacts on the development.
- ◆ Excavations for construction can impact on the underlying rock formations.

GEOLOGY - POSSIBLE DURATION OF IMPACTS

- ◆ The impacts of the Geology on the development will be permanent.
- ◆ The impacts of the development on the Geology:
 1. As long as it is necessary to excavate the foundations.
 2. As soon as the foundations are laid all excess rubble will be removed.

GEOLOGY- LIKELIHOOD OF IMPACTS OCCURRING

- ◆ The likelihood of the impacts occurring is medium.

GEOLOGY - POSSIBLE SIGNIFICANCE

- ◆ If properly managed and the stipulations of the Health and Safety Act and the Geotechnical report are implemented, the significance of the impacts occurring is low.

GEOLOGY – POSSIBLE MITIGATION STEPS

The following zones were identified on the site:

Normal Development with risk:

Site Class CR/1A3F:

This zone represents the majority of the area and comprises of a relative thin top layer sand less than 0,75m in thickness of slightly collapsible and compressible or low expansive soil underlain by a competent pebble marker or calcrete, with estimated total movement of less than 7,5mm measured at surface with

the risk of shallow rock, core stones and hard pan calcrete rock outcrop adding a **R site class designation** to

the zone with **problems relating to restricted excavation to less than 1,0m**. Development on solid rock calcrete or calcrete rock outcrop known as hard pan calcrete and will have an inflated cost where special pneumatic tools and blasting will be required for the installation of services. Normal foundation techniques will be adequate to enable proper development, with proper compaction within standard strip foundations and drainage provision that will be required. It is classified as HCR in terms of the SAIEG & NHBRC guidelines (1995) or the SAICE Code of practice (1995), and 1A3F according to the classification for urban development (Partridge, Wood & Brink)(1993).

Suitable for development with precaution

Site Class PQ: Areas where small quarries or filling or dumping of spoil were identified must be rehabilitated before any construction can be allowed, and backfilling with an engineer's material may improve the developability of these zones, but these operations will dramatically increase the development cost in this zone.

Normal and special construction techniques will be required to enable proper development. This includes the use of **compaction techniques** and **site drainage** as described

9.2 TOPOGRAPHY

TOPOGRAPHY - POSSIBLE IMPACTS (TYPE)

The topography of the study area is in general flat and open, with no real rocky outcrops or ridges occurring although there are some higher elevated sections. The site is located on a northern slope towards the Orange River from 1085 to 1104 masl.

An old quarry is located towards the south of Goutrou. Most of this quarry has been filled with building rubble and informal dumping.

A detailed site survey has been carried out to establish levels. The Engineering report and the Layout plan will address issues regarding storm water. As the proposed development will be in close proximity to residential areas, safety of children and people need to be taken into consideration during the construction phase.

TOPOGRAPHY - POSSIBLE DURATION OF IMPACTS

- ◆ The duration of the storm water dispersal as well as the final layout is local and long term.

TOPOGRAPHY - LIKELIHOOD OF IMPACTS OCCURRING

- ◆ The likelihood of the impacts occurring is high.

TOPOGRAPHY - POSSIBLE SIGNIFICANCE

- ◆ If properly managed and the stipulations of the Health and Safety Act, as well as storm water management measures stipulated by DWS, DENC are met, when constructing infrastructure, the significance of the impacts occurring is low to medium.

TOPOGRAPHY – POSSIBLE MITIGATION STEPS

- ◆ Construct the necessary infrastructure to mitigate possible adverse impacts from both low and steep gradients on possible storm water events and ensure that it is properly maintained over the long term.

9.3 CLIMATE

CLIMATE - POSSIBLE IMPACTS (TYPE)

- ◆ Flooding can occur due to intense rainfall events (See topography in relation to storm water).
- ◆ Dry spells due to droughts – with the resultant dust storms and the possibility of veldt fires.

CLIMATE - POSSIBLE DURATION OF IMPACTS

- ◆ The duration of climatic impacts is difficult to determine, as climatic fluctuations are extremely difficult to predict. The impacts may be local and short term after an intense rainfall event, but may be long-term during droughts.

CLIMATE - LIKELIHOOD OF IMPACTS OCCURRING

- ◆ The likelihood of the impacts occurring is medium to high.

CLIMATE - POSSIBLE SIGNIFICANCE

- ◆ The significance of extreme climatic events can be high.
- ◆ If properly managed and the stipulations of the Health and Safety Act, DWS, The Department of Environment and Nature Conservation and the Thembelihle Local Municipality implemented when constructing infrastructure, the significance of the impacts occurring is low to medium.

CLIMATE – POSSIBLE MITIGATION STEPS

- ◆ Construct the necessary infrastructure to mitigate adverse impacts of possible flood events (see topography above).
- ◆ In the event of extremely dry spells during the construction phase; plan to spray exposed surfaces with water to curb excessive dust generation.

9.4 SOIL

SOIL - POSSIBLE IMPACTS (TYPE)

- ◆ Soil erosion due to either floods or dry spells (wind erosion), (See topography in relation to storm water).
- ◆ Soil disturbance due to construction activities.

SOIL - POSSIBLE DURATION OF IMPACTS

- ◆ The duration of erosion caused by either floods or dry spells are difficult to determine due to the uncertainty associated with weather cycles.
- ◆ Problems associated with soils as part of construction activities are dependent on the time that will be spent on construction. It is envisaged that construction will take approximately one

year.

SOIL - LIKELIHOOD OF IMPACTS OCCURRING

- ◆ The likelihood of both the impacts occurring is high.

SOIL - POSSIBLE SIGNIFICANCE

- ◆ The significance of climatic events on the soil is low to medium depending on the implementation of mitigation measures. The impact deriving from construction activities are normally (if sound management practices are implemented) regarded as low to medium.
- ◆ If properly managed and the stipulations of the Conservation of Agricultural Resources Act, 1983 (Act 43 of 1983) implemented when constructing infrastructure, the significance of the impacts occurring is low to medium.

SOIL – POSSIBLE MITIGATION STEPS

- ◆ Ensure that the mitigation measures described for the protection of soils denuded of vegetation, as well as of soils disturbed during the construction phase are implemented. (see topography above and refer to the Civil Engineer's internal road and storm water design specifications).

9.5 WATER

WATER - POSSIBLE IMPACTS (TYPE)

- ◆ Floods as a result of intense rainfall events.
- ◆ Pollution of surface and/or ground water resources.

WATER - POSSIBLE DURATION OF IMPACTS

- ◆ The duration of floods is virtually impossible to determine as climatic fluctuations are extremely difficult to predict.
- ◆ If pollution of surface and/or ground water resources are occurring, it is usually likely due to mismanagement of either water dispersal/water pollution (e.g. by sewage) or poor management, it can be considered to be local and long-term for underground water and regional and short term for surface water resources.

WATER - LIKELIHOOD OF IMPACTS OCCURRING

- ◆ The likelihood of the impacts occurring is low to medium

WATER - POSSIBLE SIGNIFICANCE

- ◆ The significance of extreme climatic events can be high.
- ◆ The significance of pollution occurring will be low if all the proposed mitigation steps are implemented.

WATER – POSSIBLE MITIGATION STEPS

- ◆ Implement plans to prevent the possible contamination of surface and/or underground water

resources. This can be accomplished by implementing measures described in both the bio-physical as well as the socio-economical sections of this document.

9.6 FLORA

FLORA - POSSIBLE IMPACTS (TYPE)

- ◆ The denuding of surfaces due to construction activities and the resultant erosion (water and wind).
- ◆ Invasion by non-indigenous species.

FLORA - POSSIBLE DURATION OF IMPACTS

- ◆ The impacts derived from denuded surfaces will depend entirely on the effectiveness and dedication to the principal of rehabilitation of disturbed surfaces. In the extreme scenario – the impact can last for years, or in the favourable scenario – impacts can last for a few months only. If the proposed mitigation measures are implemented, the duration of the impacts will be local and short term.
- ◆ The duration of impacts from invasive species, also depend entirely on the dedication and/or lack of dedication to the invasive prevention programs. If the proposed mitigation measures are implemented, the duration of the impacts will be local and short term.

FLORA - LIKELIHOOD OF IMPACTS OCCURRING

- ◆ The likelihood of the impacts occurring during the construction phase is high.
- ◆ The positive impacts derived from the proposed mitigation measures will be local and long term and of high significance.

FLORA - POSSIBLE SIGNIFICANCE

- ◆ The significance of both denuded surfaces and/or invasive intrusions are low if the proposed mitigation measures are implemented.

FLORA – POSSIBLE MITIGATION STEPS

- ◆ Implement the rehabilitation plans for vegetation as well as the elimination of invader species at the earliest possible moment.

9.7 FAUNA

FAUNA - POSSIBLE IMPACTS (TYPE):

- ◆ Disturbance of habitats.

FAUNA - POSSIBLE DURATION OF IMPACTS

- ◆ The impact on burrowing mammals and reptiles of all kinds are likely to be local and short term during the construction phase.
- ◆ All types of indigenous fauna are likely to survive and even re-colonise the area (if proper rehabilitation of flora is implemented).

FAUNA - LIKELIHOOD OF IMPACTS OCCURRING

- ◆ The likelihood of the negative impacts occurring is high, while sound environmental practices may result to some degree of success as far as the return of faunal species are concerned.

FAUNA - POSSIBLE SIGNIFICANCE

- ◆ The significance of the expected faunal impacts is low – depending on the degree of success achieved through habitat restoration.

FAUNA - MITIGATION STEPS

- ◆ Take the necessary steps to preserve the few remaining faunal species and enhance their chances of survival by implementing rehabilitation measures for flora.

9.8 AIR QUALITY

AIR QUALITY - POSSIBLE IMPACTS (TYPE):

- ◆ Dust – due to exposed soils.

AIR QUALITY - POSSIBLE DURATION OF IMPACTS

- ◆ The duration of these impacts will be local and short term.

AIR QUALITY - LIKELIHOOD OF IMPACTS OCCURRING

- ◆ The likelihood of the negative impacts occurring is medium to high.

AIR QUALITY - POSSIBLE SIGNIFICANCE

- ◆ The significance of the expected air quality impacts is low, if proper mitigation measures are followed in terms of dust suppression.

AIR QUALITY - MITIGATION STEPS

- ◆ Take the necessary steps to prevent dust generation by spraying water over denuded surfaces during dry spells.

9.9 NOISE

NOISE - POSSIBLE IMPACTS (TYPE):

- ◆ Noise pollution due to construction activities.

NOISE - POSSIBLE DURATION OF IMPACTS

- ◆ The duration of the impacts will be local and short term.

NOISE - LIKELIHOOD OF IMPACTS OCCURRING

- ◆ The likelihood of the negative impacts occurring is low.

NOISE - POSSIBLE SIGNIFICANCE

- ◆ The significance of this impact is judged to be medium, providing the restrictions of construction and operational times are adhered to.

NOISE - MITIGATION STEPS

- ◆ Take the necessary steps to restrict construction and operational times to normal working hours.

9.10 AESTHETICS

AESTHETICS - POSSIBLE IMPACTS (TYPE):

- ◆ Disturbance of the ambiance of the surrounding area due to construction activities and an increased number of people in the area.
- ◆ Positive impacts may however occur if the necessary rehabilitation measures described for fauna and flora are implemented.

AESTHETICS - POSSIBLE DURATION OF IMPACTS

- ◆ The duration of these negative impacts are likely to be long term if the necessary rehabilitation is not implemented. If proper rehabilitation is a priority for the future occupants of the site, the negative impacts may be local and short term.

AESTHETICS QUALITY - LIKELIHOOD OF IMPACTS OCCURRING

- ◆ The likelihood of the positive impacts occurring is high if proper mitigation steps are implemented.

AESTHETICS - POSSIBLE SIGNIFICANCE

- ◆ The likelihood of the negative impacts occurring is highly significant as it could detract from the quality of life of concerned citizens. If proper rehabilitation is a priority to the future occupants of the site, the positive impacts may become the dominant factor (improving aesthetics).

AESTHETICS - MITIGATION STEPS

- ◆ Implement the necessary rehabilitation measures to enhance the aesthetics of the area.

9.11 SOCIO-ECONOMIC ASPECTS

SOCIO-ECONOMIC ASPECTS - POSSIBLE IMPACTS (TYPE)

- ◆ Employment opportunities will be created for some of the unemployed people in the area (especially in relation to the proposed business uses).
- ◆ Skills improvement will be provided for presently unskilled (or semi-skilled workers) living in the area.
- ◆ Providing the management plan for the project is correctly implemented; the present nature of the area where the proposed development is planned, can be maintained.
- ◆ The quality of life for people working in the proposed development can be maintained at an

acceptable level if ALL the necessary steps are followed when services are provided.

- ◆ All possible negative impacts** that may be derived from poor environmental performances during all the project phases, must be identified, monitored, and mitigation steps implemented.
- ◆ The graveyard site (Site 3) is located outside of the study and development area and is of recent age and origin.

SOCIO-ECONOMIC ASPECTS - POSSIBLE DURATION OF IMPACTS

- ◆ The duration of these impacts will be entirely dependent on the duration of the construction phase, the implementation of possible mitigation measures and the dedication of the applicant, contractors and eventual occupants of the new residential area to sound environmental principles (including management plans / mitigation measures, etc). The overall duration of impacts can be considered to be long term.
- ◆ Employment generated by the proposed businesses will have a medium to long term impact.
- ◆ The impact of the graveyard will be permanent as it will have to remain fenced off.

SOCIO-ECONOMIC ASPECTS - LIKELIHOOD OF IMPACTS OCCURRING

- ◆ The likelihood of the impacts occurring is high.

SOCIO-ECONOMIC ASPECTS - POSSIBLE SIGNIFICANCE

- ◆ The significance of this impact is judged to be medium to high.

SOCIO-ECONOMICS - MITIGATION STEPS

- ◆ Implement all the management steps described in this document to enhance the socio-economic aspects of the area.

10. PUBLIC PARTICIPATION

10.1 ADVERTISEMENT AND NOTICE

Publication name	Noordkaap Newspaper	
Date published	10/12/2020	
Site notice position	29°37'21.46"S	24° 6'32.67"E
	29°37'21.56"S	24° 6'9.63"E
	29°36'40.30"S	24° 6'33.79"E
	29°37'12.69"S	24° 6'32.17"E
Date placed	07/12/2020	

Proof of the placement of the relevant advertisements and notices can be found in Appendix I1.

10.2 DETERMINATION OF APPROPRIATE MEASURES

Provide details of the measures taken to include all potential I&APs as required by Regulation 41(2)(e) and 41(6) of GN R.982.

Key stakeholders (other than organs of state) identified in terms of Regulation 40(2)(d) of GN R.982:

Title, Name and Surname	Affiliation/ key stakeholder status	Contact details (tel number or e-mail address)
Various	Adjoining Landowners	Letter drop see photographic evidence

Include proof that the key stakeholder received written notification of the proposed activities as Appendix I2. This proof may include any of the following:

- e-mail delivery reports;
- registered mail receipts;
- courier waybills;
- **signed acknowledgements of receipt;** and/or
- or any other proof as agreed upon by the competent authority

10.3 Issues raised by interested and affected parties

Summary of main issues raised by I&APs	Summary of response from EAP
To Follow as part of final S24G report	To Follow as part of final S24G report

10.4 COMMENTS AND RESPONSE REPORT

The practitioner must make report (s) available to I&APs record all comments received from I&APs and respond to each comment before is submitted. The comments and responses must be captured in a

comments and response report as prescribed in the EIA Regulations and be attached to the Final BAR as Appendix I3.

10.5 AUTHORITY PARTICIPATION

Authorities and organs of state identified as key stakeholders. Key stakeholders identified in terms of Regulation 7(1) and (2) and Regulation 40(2) (a)-(c) of GN R.982:

Authority/Organ of State	Contact person (Title, Name and Surname)	Tel No	Fax No	e-mail	Postal address
Department of Water and Sanitation Northern Cape office	The Registry: Consultation on EIA applications	054 338 5800	(054) 334 0205		Louisvale Road Upington 8800
Northern Cape Department of Agriculture and Land Reform and Rural Development	HOD, Mr. V. Mothibi	(053) 838 9118	(053) 831 3635	cfortune@agri.ncpg.gov	Private Bag X5018, Kimberley 8300
Northern Cape Department of Environment and Nature Conservation	Mr. Dewald Badenhorst Biodiversity Management services	(053) 807 7300	(053) 807 7367		Private Bag X6120 Kimberley 8301
Northern Cape Department of Agriculture, Forestry and Fisheries	Mrs. J Mans	(054) 338 5860	(054) 338 0030		P.O. Box 2782, Upington 8800
Northern Cape Department Roads and Public Works	The director: Roads	053 839 2100			PO Box 3132 Kimberley 8300
South African Civil Aviation Authority (SACAA)	Ms Nivashnee Naraindath (Company Secretary and Executive Manager)	011 545 1000	011 545 1455	mail@caa.co.za	Private Bag X73 Halfway House 1685
Pixley Ka Seme District Municipality	The Municipal Manager: Mr. RE Pieterse	053 631 0891	053 631 2529		Private Bag X3 Hopetown 8750

Thembelihle Local Municipality	The Municipal Manager: Mr. MR Jack	053 203 0005/0008	053 203 0490		Private Bag X3 Hopetown 8750
Thembelihle Local Municipality	The councilor ward 2	053 203 0005/0008	053 203 0490		Private Bag X3 Hopetown 8750
Thembelihle Local Municipality	The councilor ward 4	053 203 0005/0008	053 203 0490		Private Bag X3 Hopetown 8750
SAHRA	SAHRIS				

Include proof that the Authorities and Organs of State received written notification and draft reports of the proposed activities as Appendix I4.

10.6 CONSULTATION WITH OTHER STAKEHOLDERS

Note that, for any activities (linear or other) where deviation from the public participation requirements may be appropriate, the person conducting the public participation process may deviate from the requirements of that sub-regulation to the extent and in the manner as may be agreed to by the competent authority.

Proof of any such agreement must be provided, where applicable. Application for any deviation from the regulations relating to the public participation process must be submitted prior to the commencement of the public participation process.

A list of registered I&APs must be included as Appendix I5.

Copies of any correspondence and minutes of any meetings held must be included in Appendix I6.

11. CONCLUSIONS AND RECOMMENDATIONS

AB Enviro Consult was appointed by the Thembelihle Local Municipality in association with the Department of Co-operative Governance, Human Settlements and Traditional Affairs of the Northern Cape (COGHSTA) to apply for Authorization for the "Proposed" Establishment of a Township on the site. A site inspection held on 23 November 2019 revealed that construction activities on site has already commenced and that the Applicant will have to apply for the rectification of unlawful commencement or continuation of a listed activity in terms of Section 24G of the National Environmental Management Act, 1998 (Act No. 107 of 1998) as amended.

Apart from the Informal Settlement that has taken place on site, other activities commenced with is mostly related to service provision in the form of VIP toilets, roads, standpipes and electricity. Stand numbers

has also been allocated, indicating a planned formalization process. The Applicant was not aware that they required Environmental Authorization before starting with provision of essential services in the area.

The intension of this application is thus to legalise the commencement of the clearance of 102.3852 ha of indigenous vegetation in order to formalise a township, situated on a Portion of the Remaining Extent of Erf 1, Hopetown, within the Thembelihle Local Municipality, Northern-Cape Province.

This Chapter of the Report provides a summary of the findings of the S24G process, including the EAP's opinion as to whether the activity should or should not be authorised.

11.1 ENVIRONMENTAL IMPACT STATEMENT

The detailed environmental assessment for the proposed development, has not found any environmental impacts that *cannot* be mitigated to acceptable and manageable levels.

In the National Framework for Sustainable Development (NFSD) it is stated that *"the achievement of sustainable development is not a once-off occurrence and its objectives cannot be achieved by a single action or decision. It is an ongoing process that requires a particular set of values and attitudes in which economic, social and environmental assets that society has at its disposal, are managed in a manner that sustains human well-being without compromising the ability of future generations to meet their own need. The NFSD further continues to emphasize that South Africa's current development path in certain instances reflects signs of being unsustainable in the long-term. It highlights that a large percentage of growth in economic activity (measured in terms of its contribution to the GDP) is achieved by 'consuming' natural resources and degrading our habitat at accelerating rates with the inevitable consequence that future economic growth and development objectives will be prejudiced. "*

Consistent with national priorities, environmental authorities must support *"increased economic growth and promote social inclusion"*, whilst ensuring that such growth is *"ecologically sustainable"*. In the National Spatial Development Perspective (NSDP) it is highlighted that, to achieve the goal of stimulating sustainable economic activities and to create long-term employment opportunities, it is required that spending on economic infrastructure is focused in priority areas with potential for economic development, with development to serve the broader societies' needs equitably.

As in the rest of South Africa, there is a housing shortage in the area.

The identification, description, evaluation and comparison of alternatives are important for ensuring a sound environmental scoping process.

The alternatives considered for the proposed development includes "Mixed land use township" (Alternative 1), "Single land use: Housing only" (Alternative 2) and the "No-go option."

Although the emphasis is on housing, complimentary land uses have been included in the township. People want easy access to job opportunities shops, banking facilities, clinics, etc. and want their living environment, such as residential townships to be placed at strategic positions with good access routes in close proximity to these amenities.

A mixed land use development is *socially responsible* based on the following:

- It covers the mixed and lower income bracket by providing a higher density housing option;
- The development will inevitably support the use of public transport;

- The development will include supporting social infrastructure (schools), as well as some retail or commercial activities;
- The layout of the development must respond to the future road planning for the area, to facilitate and maximise pedestrianisation and public transport.
- Commercial erven can accommodate a shopping centre, to service the existing formalised and informal settlements in the area. The commercial node will:
 - Promote entrepreneurial services and products;
 - Be within walking distance to places of refreshment and trade for residents;
 - Provide Job opportunities; and
 - Improve neighbourhood quality.

By providing only one land use type (i.e., housing), mixed income development and social integration across race and income levels, *cannot be achieved*. By restricting a township to one land use only, the above benefits to the local community, and subsequent council area, cannot be realised, and hence, is not a preferred land use option.

The only other alternative that exists for the proposed development is the “no-go” option which will imply that the status quo will prevail. This is unacceptable as Informal settlements consist of non-conventional housing built without complying with legal building procedures. Broadly, these crude dwellings mostly lack proper indoor infrastructure, such as water supply, sanitation, drainage, waste disposal and proper road access. There is also a bond between poor housing and environmental conditions in informal settlements which also reflects poverty. Linking basic services such as water to health is viewed as a false separation as these services are ‘intimately related to housing’. It becomes a housing issue if children playing outside the house contract diarrhoea via ingesting pathogens from faecal matter which contaminates the land on which they play. Otherwise, it is the house which provides for shelter against injury, weather and disease. Improving the surroundings of the house is to limit severe health risks existing within poor quality housing.

The proposed development will address this shortage.

Specialist studies were conducted and a full Public Participation Process was followed. This information was used to generate a sensitivity map that was used to assess the sustainability of the design and layout plan for the proposed development.

11.2 ENVIRONMENTAL MANAGEMENT PROGRAMME (EMPR)

EMPR’s aim to identify and minimise the potential impacts that the proposed construction and operational phases of the project may have on the receiving environment. An EMPR has been developed which is contained in Appendix E and includes detailed mitigatory measures for the construction phase.

As a general guideline, the EMPR should be based on a comprehensive set of environmental aspects (elements of the facility that can interact with the environment), and hence, the EMPR compiled for this application includes the following key components:

- Mechanisms for the on-going identification and assessment of environmental aspects and impacts;
- Environmental management programmes; objectives and targets;
- Environmental monitoring and reporting framework;
- Environmental management procedures; and,

- Mechanisms for the recording of environmental incidents and implementing corrective and preventative actions.

11.3 EAP OPINION

The information contained in this Report and Specialist Studies, provides a detailed and comprehensive description of the proposed project, baseline environment and potential environmental impacts associated with the proposed development. As no significant impacts that cannot be mitigated were identified, AB Enviro Consult is of the opinion that the project should proceed, provided that the necessary mitigation and management measures are implemented.

Under South African environmental legislation, the Applicant is accountable for the potential impacts of the activities that are undertaken and is responsible for managing these impacts. The Applicant therefore has overall and total environmental responsibility to ensure that the implementation of the construction phase of the EMPR complies with the relevant legislation and the conditions of the environmental authorisation. The applicant will thus be responsible for the implementation of the EMPR.

The environmental management programme (EMPR) should form part of the contract between the construction company and the applicant. This will help ensure that the EMPR is adhered to. It is suggested that a suitably qualified Environmental Control Officer (ECO) be appointed for the construction phase.

11.4 CONDITIONS RECOMMENDED TO BE INCLUDED IN ANY AUTHORISATION THAT MAY BE GRANTED BY THE COMPETENT AUTHORITY IN RESPECT OF THE APPLICATION

1. A complete copy of the signed EA in terms of NEMA, granting approval for the development must be available on site
2. A copy of the EMPR as well as any amendments thereof must be available on site
3. A suitably qualified ECO must be appointed.
4. Impacts on the environment must be minimised during site establishment and the development footprint must be kept to the approved development area.
5. Vegetation clearing may not commence until such time as the development footprint has been clearly defined.
6. No clearance of vegetation outside of the development footprint may occur.
7. At the end of the construction phase the site and its surrounding area must be free from any pollution that originated as a result of the construction activities.
8. No disturbance of topsoil & subsoil may commence until such time as the development footprint has been clearly defined.
9. No disturbance of topsoil & subsoil outside of the development footprint may occur.
10. At the end of the construction phase the site and its surrounding area must be free from any chemical, fuel, oil and cement spills that originated as a result of the construction activities.
11. At the end of the construction phase the site and its surrounding area must be free from any sewage that originated as a result of the construction activities.
12. At the end of the construction phase the site and its surrounding area must be free from any hazardous or general waste pollution that originated as a result of the construction activities.
13. Dust prevention measures must be applied to minimise the generation of dust.

14. Noise prevention measures must be applied to minimise the generation of unnecessary noise pollution as a result of construction activities on site.
15. Absolutely no burning of waste is permitted.
16. Fires will only be allowed in facilities especially constructed for this purpose.
17. No hunting of animals will be allowed.
18. No intentional destruction of any sites, features or material of cultural heritage (archaeological and/or historical) origin or significance may occur.
19. All Contractors and sub-contractors must abide to the rules and regulations of the Occupational Health and Safety Act, 85 of 1993.

12. AFFIRMATION BY EAP

I Mrs. J.E. du Plooy-(name of person representing EAP) of –AB ENVIRO-CONSULT CC---(name of company) declare that the information provided is correct and relevant to the activity/ project and that, the information was made available to interested and affected parties for their comments. All specialist (s) reports are relevant for the competent authority to make informed decision.

**SIGNATURE OF
EAP**

05/12/2020

DATE

SECTION F: APPENDICES

The following appendices are attached:

Appendix A: A3 Locality Map

Appendix B: Layout Plan and Sensitivity Maps

Appendix C: Photographs

Appendix D: Facility illustration(s)

Appendix E: Confirmation of services by Municipality (servitude and infrastructure planning)

Appendix F: Details and expertise of Specialist and Declaration of Interest

Appendix G: Specialist reports (including terms of reference)

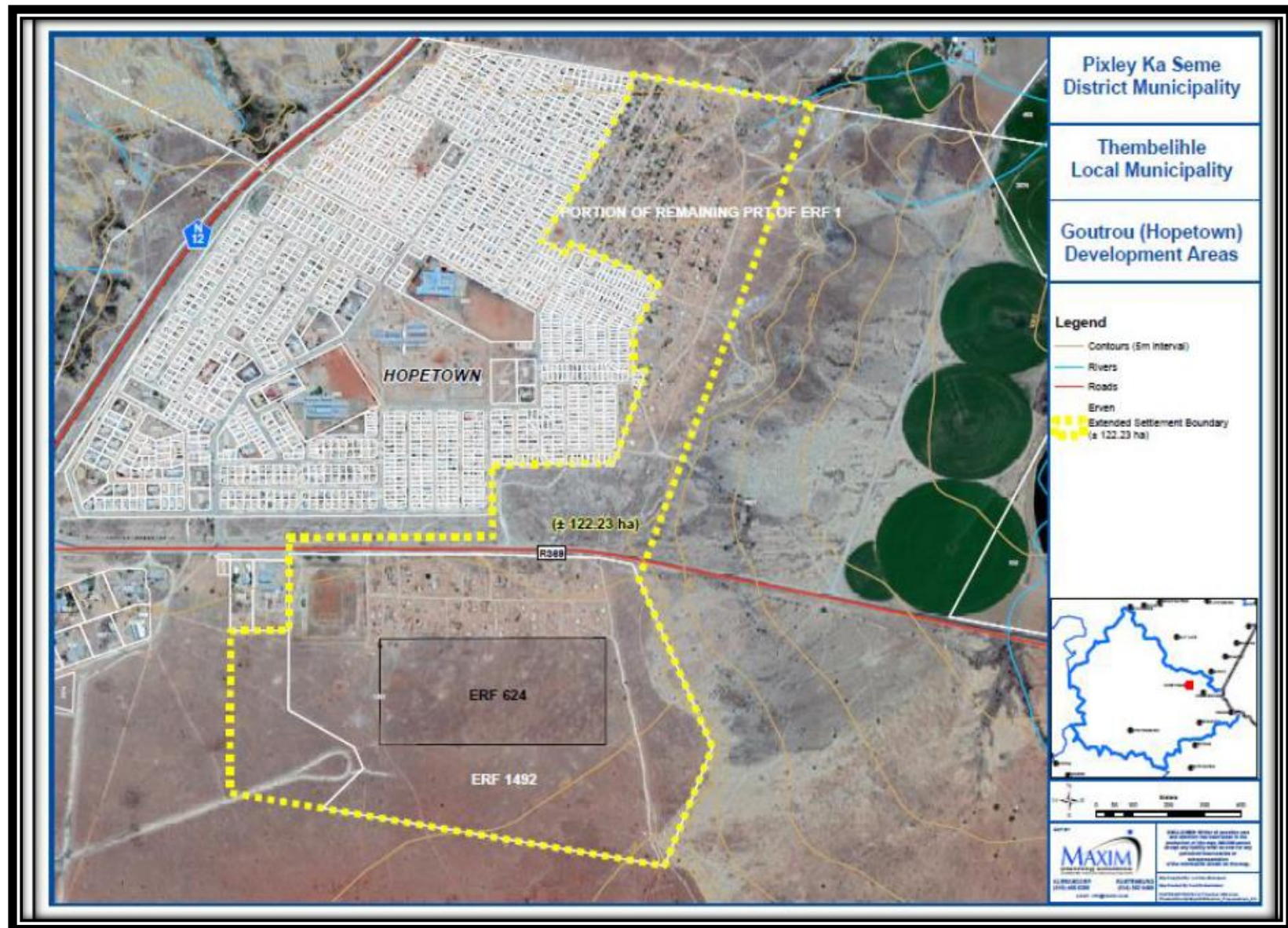
Appendix H: Impact Assessment

Appendix I: Public Participation

Appendix J: Environmental Management Programme (EMPr)

Appendix K: Details of EAP and expertise

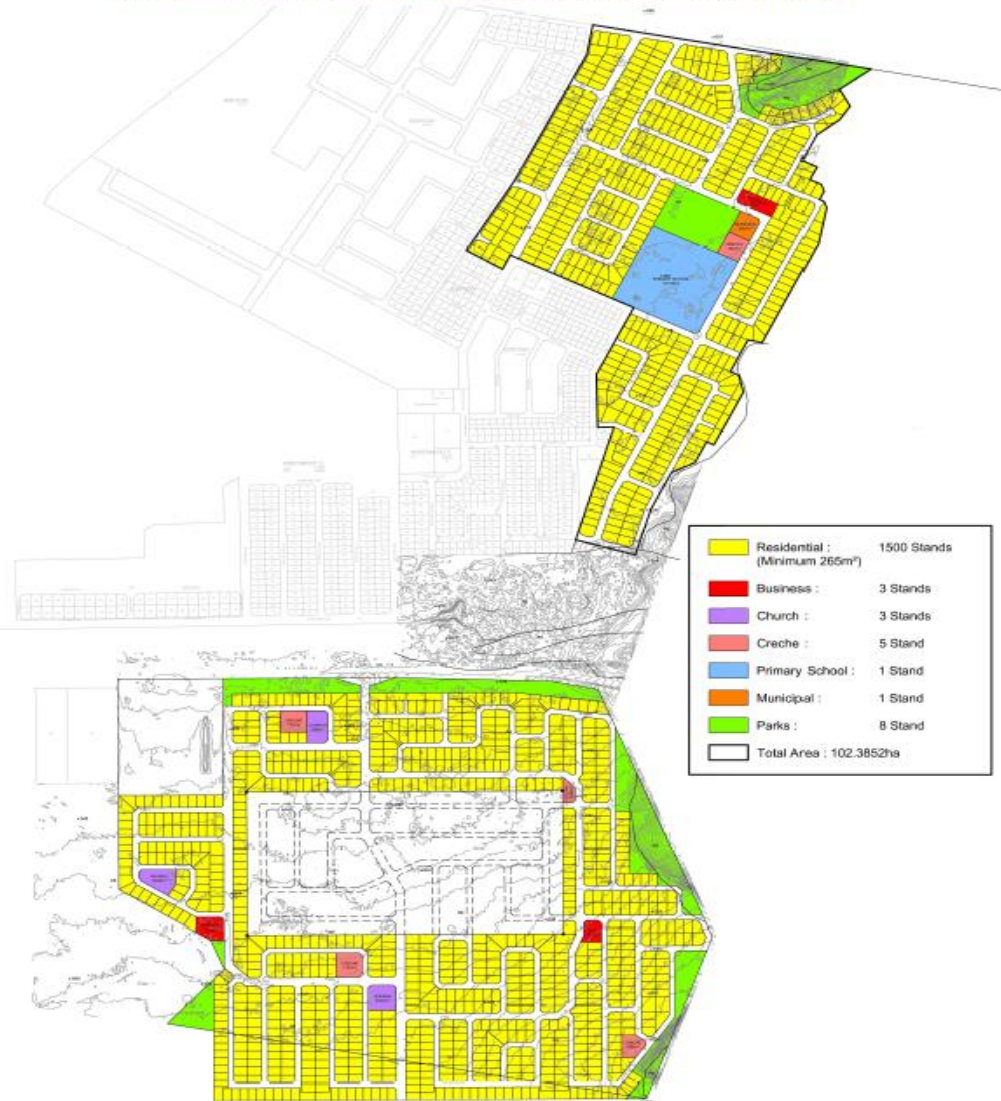
APPENDIX A: LOCALITY MAP



APPENDIX B: LAYOUT PLAN AND SENSITIVITY MAPS



DRAFT LAYOUT PLAN :
PROPOSED TOWNSHIP GOU TROU (1500)
ON A PORTION OF THE REMAINING EXTENT OF ERF 1, HOPETOWN

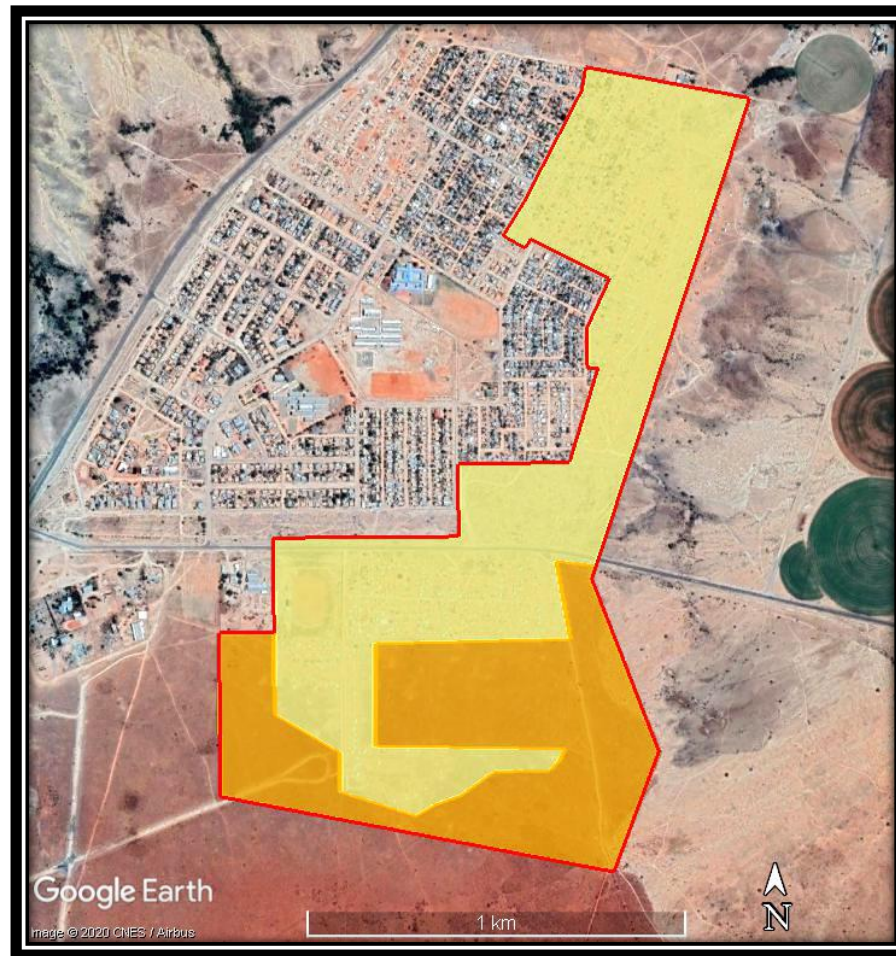


Scale 1 : 6 500



COGHSTA
Department of Co-operative Governance,
Human Settlements and Traditional Affairs
of the Northern Cape





- Red outline Boundaries of the site
- Orange-brown outline and shading Medium Sensitivity
- Light yellow outline and shading Low Sensitivity

APPENDIX C: PHOTOGRAPHS

Goutrou: View towards the North



Goutrou: View towards the North-East



Goutrou: View towards the East



Goutrou: View towards the South-East



Goutrou: View towards the South



Goutrou: View towards the South-West



Goutrou: View towards the West



Goutrou: View towards the North-West



Hillside: View towards the North



Hillside: View towards the North-East



Hillside: View towards the East



Hillside: View towards the South-East



Hillside: View towards the South



Hillside: View towards the South-West



Hillside: View towards the West

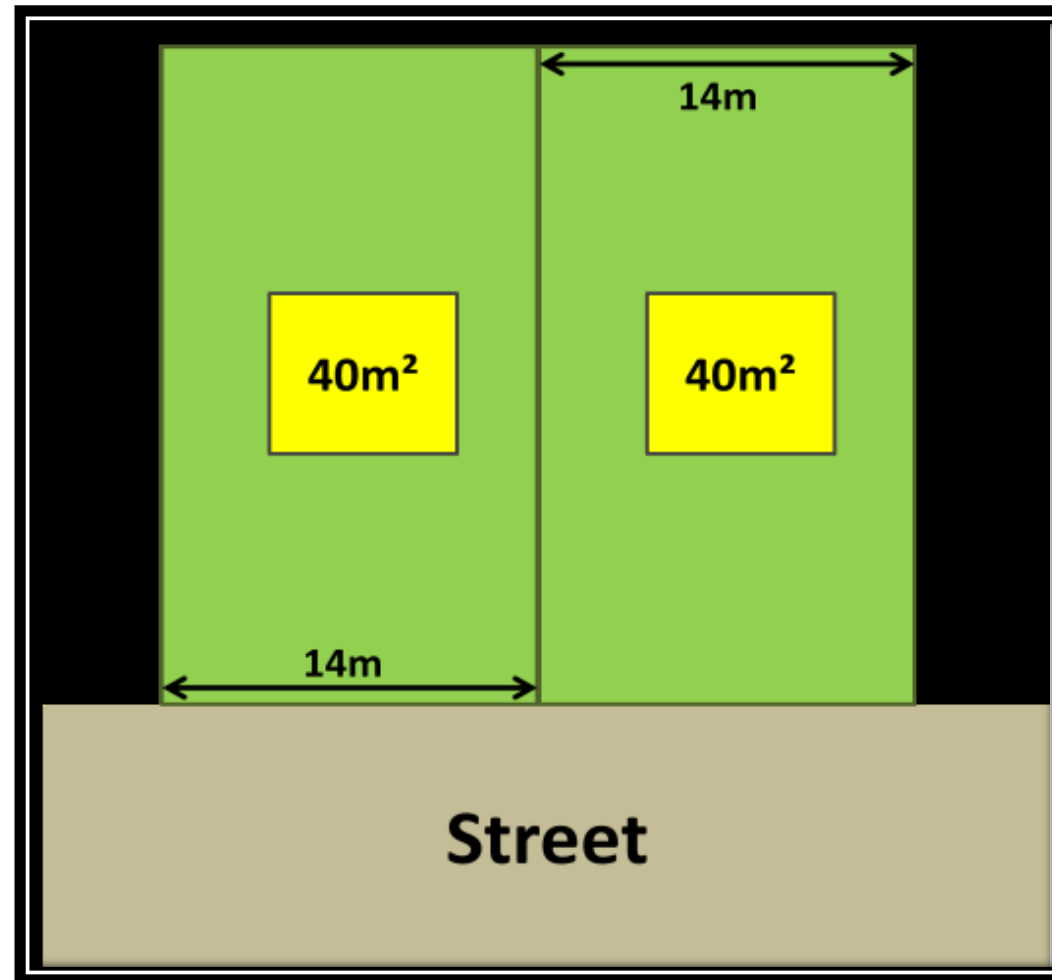


Hillside: View towards the North-West



APPENDIX D: FACILITY ILLUSTRATION(S)

A stand of 350m² with a subsidised house of 40m² provides more than sufficient outdoor space.





**APPENDIX E:
CONFIRMATION OF SERVICES BY
MUNICIPALITY**



THEMBELIHLE

*Incorporating the towns of Strydenburg and Hopetown
Northern Cape Province, Republic of South Africa*

Enquiries/ Dipatlisiso/ Imibuzo/ Navrao : Dr S Marufu 063 688 1296

LOCAL MUNICIPALITY
PLAASLIKE MUNISIPALITEIT
U-MASIPALA WASEKUHALENI

Private bag X3 HOPETOWN 8750
Church Street HOPETOWN 8750
(053) 203 0005/8
Fax (053) 203 0490
www.thembelihlemunicipality.gov.za

23 April 2020

WATER AND SANITATION ADEQUACY FOR GOUTROU 1500

To - Barzani Group

From – Mr CJ Scheepers – PMU Technician

As discussed in the meeting held on 19 March 2020, please note the following information regarding the water supply and sanitation in Hopetown:

Sanitation

- Upgrading of outfall sewer: The outfall sewer is being upgraded and is currently in its final phase of construction. The initial completion date was 1 June 2020 but is extended due to the national lockdown taking place.
- The wastewater treatment plant is being upgraded

Water Supply

- Technical Manager, Dr S Marufu confirmed that the current water supply will be sufficient for the addition of 1 500 stalls.

I hope you find this information in order

Yours truly

Mr CJ Scheepers
Project Management Unit Technician

**APPENDIX F:
DETAILS AND EXPERTISE OF
SPECIALIST AND DECLARATION OF
INTEREST
(To follow)**

APPENDIX G: SPECIALIST REPORTS (INCLUDING TERMS OF REFERENCE)

APPENDIX G 1: GEO-TECHNICAL REPORT

APPENDIX G 2: CIVIL AND ELECTRICAL SERVICES REPORT

APPENDIX G 3: TRAFFIC IMPACT ASSESSMENT REPORT

APPENDIX G 4: ECOLOGICAL REPORT

APPENDIX G 5: SAHRA REPORT

APPENDIX H: IMPACT ASSESSMENT

ENVIRONMENTAL IMPACT ASSESSMENT

INTRODUCTION

The purpose of this document is to adhere to the requirements for compilation of Environmental Impact Assessment Reports as amended and published in Government Notice R.326 of 7 April 2017, Appendix 2, and the National Environmental Management Act (Act 107 of 1998) (NEMA) for the Legalization of the commencement of the clearance of 102.3852 ha of indigenous vegetation in order to formalise a township, currently known as the informal settlements of Goutrou and Hillside, situated on a Portion of the Remaining Extent of Erf 1, Hopetown, within the Thembelihle Local Municipality, Northern-Cape Province.

DESCRIPTION OF THE PROCESS FOLLOWED

In order to assess a proposed development it is important to take into consideration the principles of NEMA. These principles are outlined in Chapter 1 and read as follows:

- 5) *"The principles set out in this section apply throughout the Republic to the actions of all organs of state that may significantly affect the environment and—*
 - f. *shall apply alongside all other appropriate and relevant considerations, including the State's responsibility to respect, protect, promote and fulfil the social and economic rights in Chapter 2 of the Constitution and in particular the basic needs of categories of persons disadvantaged by unfair discrimination;*
 - g. *serve as the general framework within which environmental management and implementation plans must be formulated;*
 - h. *serve as guidelines by reference to which any organ of state must exercise any function when taking any decision in terms of this Act or any statutory provision concerning the protection of the environment;*
 - i. *serve as principles by reference to which a conciliator appointed under this Act must make recommendations; and*
 - j. *guide the interpretation administration and implementation of this Act, and any other law concerned with the protection or management of the environment.*
- 6) *Environmental management must place people and their needs at the forefront of its concern, and serve their physical, psychological, developmental, cultural and social interests equitably.*
- 7) *Development must be socially, environmentally and economically sustainable.*
- 8) (a) *Sustainable development requires the consideration of all relevant factors including the following:*
 - (i) *That the disturbance of ecosystems and loss of biological diversity are avoided, or, where they cannot be altogether avoided, are minimised and remedied;*
 - (ii) *that pollution and degradation of the environment are avoided, or, where they cannot be altogether avoided, are minimised and remedied;*
 - (iii) *that the disturbance of landscapes and sites that constitute the nation's cultural heritage is avoided, or where it cannot be altogether avoided, is minimised and remedied;*
 - (iv) *that waste is avoided, or where it cannot be altogether avoided, minimised and re-used or recycled where possible and otherwise disposed of in a responsible manner;*
 - (v) *that the use and exploitation of non-renewable natural resources is responsible and equitable, and takes into account the consequences of the depletion of the resource;*
 - (vi) *that the development, use and exploitation of renewable resources and the ecosystems of which they are part do not exceed the level beyond which their integrity is jeopardised;*
 - (vii) *that a risk-averse and cautious approach is applied, which takes into account the limits of current knowledge about the consequences of decisions and actions; and*

- (viii) *that negative impacts on the environment and on people's environmental rights be anticipated and prevented, and where they cannot be altogether prevented. are minimised and remedied.*
- (b) *Environmental management must be integrated, acknowledging that all elements of the environment are linked and interrelated, and it must take into account the effects of decisions on all aspects of the environment and all people in the environment by pursuing the selection of the best practicable environmental option.*
- (c) *Environmental justice must be pursued so that adverse environmental impacts shall not be distributed in such a manner as to unfairly discriminate against any person, particularly vulnerable and disadvantaged persons.*
- (d) *Equitable access to environmental resources, benefits and services to meet basic human needs and ensure human well-being must be pursued and special measures may be taken to ensure access thereto by categories of persons disadvantaged by unfair discrimination.*
- (e) *Responsibility for the environmental health and safety consequences of a policy, programme, project, product, process, service or activity exists throughout its life cycle.*
- (f) *The participation of all interested and affected parties in environmental governance must be promoted, and all people must have the opportunity to develop the understanding, skills and capacity necessary for achieving equitable and effective participation and participation by vulnerable and disadvantaged persons must be ensured.*
- (g) *Decisions must take into account the interests, needs and values of all interested and affected parties, and this includes recognizing all forms of knowledge, including traditional and ordinary knowledge.*
- (h) *Community wellbeing and empowerment must be promoted through environmental education, the raising of environmental awareness, the sharing of knowledge and experience and other appropriate means.*
- (i) *The social, economic and environmental impacts of activities, including disadvantages and benefits must be considered, assessed and evaluated and decisions must be appropriate in the light of such consideration and assessment.*
- (j) *The right of workers to refuse work that is harmful to human health or the environment and to be informed of dangers must be respected and protected.*
- (k) *Decisions must be taken in an open and transparent manner, and access to information must be provided in accordance with the law.*
- (l) *There must be intergovernmental co-ordination and harmonisation of policies, legislation and actions relating to the environment.*
- (m) *Actual or potential conflicts of interest between organs of state should be resolved through conflict resolution procedures.*
- (n) *Global and international responsibilities relating to the environment must be discharged in the national interest.*
- (o) *The environment is held in public trust for the people, the beneficial use of environmental resources must serve the public interest and the environment must be protected as the people's common heritage.*
- (p) *The costs of remedying pollution, environmental degradation consequent adverse health effects and of preventing, controlling or minimizing further pollution, environmental damage or adverse health effects must be paid for by those responsible for harming the environment.*
- (q) *The vital role of women and youth in environmental management and development must be recognised and their full participation therein must be promoted.*
- (r) *Sensitive, vulnerable, highly dynamic or stressed ecosystems, such as coastal shores, estuaries, wetlands and similar systems require specific attention in management and planning procedures, especially where they are subject to significant human resource usage and development pressure."*

The above mentioned principals and the applicable legislation, Policies and Guidelines as described in Section A, Paragraph 11 of the Basic Assessment Report were taken into account in the assessment of the Environmental Impacts for the proposed development. The process followed can be described as follows:

- 1) AB Enviro Consult was appointed by the Thembelihle Local Municipality in association with the Department of Co-operative Governance, Human Settlements and Traditional Affairs of the Northern Cape (COGHSTA) to apply for Authorization for the "Proposed" Establishment of a Township on the site.
- 2) A site inspection held on 23 November 2019 revealed that construction activities on site has already commenced and that the Applicant will have to apply for the rectification of unlawful commencement or continuation of a listed activity in terms of Section 24G of the National Environmental Management Act, 1998 (Act No. 107 of 1998) as amended. Apart from the Informal Settlement that has taken place on site, other activities commenced with is mostly related to service provision in the form of VIP toilets, roads, standpipes and electricity. Stand numbers has also been allocated, indicating a planned formalization process.
- 3) The Applicant was not aware that he required Environmental Authorization before starting with provision of essential services in the area.
- 4) An Environmental Screening Process was conducted by the EAP to ensure that all the relevant Environmental Legislation is taken into consideration.
- 5) Desk top studies were conducted and alternatives assessed.
- 6) Site inspections were carried out to verify the outcomes of the desktop studies, and the preferred alternative defined.
- 7) A Botanical Specialist was appointed to conduct a Botanical survey of the area. This included a vegetation and habitat study to determine possible fatal flaws and to identify sensitive / no-go areas.
- 8) A Town and Regional Planner designed the proposed development in such a way that the layout of the proposed development, takes into account the measures described by the Civil Engineer and that the layout satisfies the needs of future occupiers of the site.
- 9) A Geotechnical Engineer was appointed to determine whether the Geology and Soils of the site is suitable for the proposed development
- 10) The Civil Engineer was appointed to determine the capability of existing infrastructure to be linked to proposed development and readily available bulk services. He also designed the proposed infrastructure.
- 11) A SAHRA Specialist has been appointed to determine the possible impact of the development on Archaeological and Cultural features.
- 12) A full Public Participation Process was followed to obtain inputs from interested and affected parties.
- 13) All the information obtained from the above mentioned processes was used to assess the Environmental Impact that the proposed development may have on the Environment and vice versa.
- 14) The inputs from the Specialists, interested and affected parties, together with the knowledge of the EAP was used to determine measures to avoid, mitigate and manage potential impacts. These measures are described in the Environmental Management Programme.

ASSESSMENT CRITERIA

Impacts were rated using the following methodology:

Nature of the potential impact		Description of the effect, and the affected aspect of the environment
Duration (time scale)	Short term	Up to 5 years

Nature of the potential impact		Description of the effect, and the affected aspect of the environment
	Medium term	6 – 15 years
	Long term	More than 15 years
Extent (area)	Local	Confined to study area and its immediate surroundings
	Regional	Region (cadastral, catchment, topographic)
	National	Nationally (The country)
	International	Neighboring countries and the rest of the world.
Magnitude (Intensity)	Low	Site-specific and wider natural and/or social functions and processes are negligibly altered. ((A low intensity impact will not affect the natural, cultural, or social functions of the environment).
	Medium	Site-specific and wider natural and/or social functions and processes continue albeit in a modified way. (Medium scale impact will alter the different functions slightly).
	High	Site-specific and wider natural and/or social functions and processes are severely altered. (A High intensity impact will influence these functions to such an extent that it will temporarily or permanently cease to exist).
Probability	Improbable	Possibility of occurrence is very low. (Such an impact will have a very slight possibility to materialise, because of design or experience).
	Possible	There is a possibility that the impact will occur
	Probable	It is most likely that the impact will occur
	Definite	The impact will definitely occur
Significance	Insignificant	Impact is negligible and will not have an influence on the decision regarding the proposed activity (No mitigation is necessary)
	Very Low	Impact is very small and should not have any meaningful influence on the decision regarding the proposed activity (No mitigation is necessary)
	Low	The impact may not have a meaningful influence on the decision regarding the proposed activity (No mitigation is necessary)
	Medium	The impact should influence the decision regarding the proposed activity (The project can only be carried through if certain mitigatory steps are taken)
	High	The impact will influence the decision regarding the proposed activity
	Very High	The proposed activity should only be approved under special circumstances

Nature of the potential impact		Description of the effect, and the affected aspect of the environment
Reversibility	Low	There is little chance of correcting the adverse impact
	Medium	There is a moderate chance of correcting the adverse impact
	High	There is a high chance in correcting the adverse impact
Risk	Low	Assessing a risk involves an analysis of the consequences and likelihood of a hazard being realized. In decision-making, low-consequence / low-probability risks (green) are typically perceived as acceptable and therefore only require monitoring.
	Medium	Other risks (amber) may require structured risk assessment to better understand the features that contribute most to the risk. These features may be candidates for management
	High	High-consequence / high-probability risks (red) are perceived as unacceptable and a strategy is required to manage the risk.

Attributes associated with the alternatives were assessed and is outlined below:

Geographical attributes

The Geographical attributes of an area relates to the characteristics of a particular region, area or place. It influences the determination of site alternatives as it relates to the location of a site in relation to relevant features in the area.

Physical attributes

Physical attributes of an area relates to the processes and patterns in the natural environment. For the purpose of this assessment, the following processes and patterns have been investigated. Geology, soil, topography and landforms, climate and meteorology, surface water and ground water.

Biological attributes

Biological attributes for the purpose of this study includes the distribution of species and ecosystems in geographic space and through geological time. Organisms and biological communities often vary in a regular fashion along geographic gradients of latitude, elevation, isolation and habitat area. The two main branches assessed will be:

Phytogeography is the branch of biogeography that studies the distribution of plants.

Zoogeography is the branch that studies distribution of animals.

Social attributes

Social attributes is closely related to social theory in general and sociology in particular, dealing with the relation of social phenomena and its spatial components.

Economic attributes

Economic attributes includes the location, distribution and spatial organization of economic activities and also takes into account social, cultural, and institutional factors in the spatial economy of the development.

Heritage attributes

The broad generic term Cultural Heritage Resources refers to any physical and spiritual property associated with past and present human use or occupation of the environment, cultural activities and history. The term includes sites, structures, places, natural features and material of paleontological, archaeological, historical, aesthetic, scientific, architectural, religious, symbolic or traditional importance to specific individuals or groups, traditional systems of cultural practice, belief or social interaction.

Cultural attributes

Cultural attributes relates to the specific characteristics such as language, religion, ethnic and racial identity, and cultural history & traditions of people. These attributes influences family life, education, economic and political structures, and, of course, business practices.

It should be noted that the above mentioned attributes do not occur in isolation and it is not uncommon for an identified impact to overlap with two or more of these attributes. Also note, not all risks require comprehensive and detailed assessment. Solid problem formulation should allow decision-makers to evaluate the extent of subsequent analysis required. The level of effort put into assessing each risk should be proportionate to its significance and priority in relation to other risks, as well as its complexity, by reference to the likely impacts. Consideration should be given to stakeholders' perceptions of the nature of the risk.

ENVIRONMENTAL IMPACT ASSESSMENT (Planning and design phase)					
ALTERNATIVE 1: Mixed land use township (Preferred Alternative)					
Environmental Attribute	Potential impacts and risks	Assessment criteria	Assessment rating (With mitigation)	Proposed mitigation	Assessment rating (Without mitigation)
DIRECT IMPACTS:					
Geographical Physical Social Economic	102.3852 hectares of indigenous vegetation have been eradicated in order to establish the informal development.	Duration	Long term	Obtain the necessary environmental authorization for the development.	Long term
		Extent	Local		Local
		Magnitude (Intensity)	High		High
		Probability	Definite	Conduct a Fauna and Flora Habitat survey to determine the sensitivity of the area.	Definite
		Significance	Medium		Medium
		Reversibility	Low		Low
		Risk	Low	Implement the mitigation measures as described in the Environmental Management Plan.	Medium
	Plan for the provision of services for the development.	Duration	Long term		Long term
		Extent	Local		Local
		Magnitude (Intensity)	High		High
		Probability	Definite	Appoint a Civil Engineer to assess the availability and design of services to ensure a sustainable development.	Definite
		Significance	Medium		Medium
		Reversibility	Low		Low
		Risk	Low		Medium
	Plan to rehabilitate disturbed surfaces which can lead to erosion and dust pollution. Prepare method statements to this effect.	Duration	Short term	Start the rehabilitation of disturbed surfaces as soon as possible. Spray bare surfaces with water to prevent dust pollution.	Medium term
		Extent	Local		Local
		Magnitude (Intensity)	Low		Medium
		Probability	Definite		Definite
		Significance	Medium		Medium
		Reversibility	High		High
		Risk	Low		Medium
	Plan for the eradication of foreign and invader plant species which are likely to invade disturbed areas.	Duration	Short term	Start the extermination of any invasive species as soon as possible and maintain the eradication programme.	Medium term
		Extent	Local		Local
		Magnitude (Intensity)	Low		Low
		Probability	Definite		Definite
		Significance	Medium		Medium
		Reversibility	High		High
		Risk	Low		Medium
	Plan for the provision and maintenance of ablution facilities for construction workers to prevent pollution of surface and underground water.	Duration	Short term	Provide portable ablution facilities that will not cause pollution during the construction phase.	Short term
		Extent	Local		Local
		Magnitude (Intensity)	Medium		Medium
		Probability	Definite	There should be 1 Chemical toilet for every 30 workers on site.	Definite
		Significance	Medium		Medium
		Reversibility	High		High
		Risk	Low		Medium
	Plan to manage possible impacts that the project can have on the soil and geology.	Duration	Long term	Properly plan the construction phase in such a manner that impacts on the soil and geology of the area can be minimised.	Long term
		Extent	Local		Local
		Magnitude (Intensity)	Low		Medium
		Probability	Definite	The findings of the Geotechnical Engineer must be incorporated into the design of the project.	Definite
		Significance	Medium		Medium
		Reversibility	High		High
		Risk	Low	Plan to prevent spills of lubricants/oils that can take place on bare soil. This	Medium

ENVIRONMENTAL IMPACT ASSESSMENT (Planning and design phase)					
ALTERNATIVE 1: Mixed land use township (Preferred Alternative)					
Environmental Attribute	Potential impacts and risks	Assessment criteria	Assessment rating (With mitigation)	Proposed mitigation	Assessment rating (Without mitigation)
	Plan for the removal of vegetation (which will lead to the destruction of faunal and floral habitats) during the construction phase.			will include the use of drip trays for vehicles that are standing for more than 24 hours.	
		Duration	Short term	Start with the rehabilitation of vegetation to minimize the negative effects of the removal of plants.	Short term
		Extent	Local		Local
		Magnitude (Intensity)	Medium		Medium
		Probability	Definite		Definite
		Significance	Medium		Medium
		Reversibility	High		High
		Risk	Low		Medium
		Extent	Local	The rule must be to minimize the disturbance of animal life by keeping the footprint as small as possible.	Local
		Magnitude (Intensity)	Medium		Medium
		Probability	Definite		Definite
		Significance	Medium		Medium
		Reversibility	High		High
		Risk	Low		Medium
	Plan to safeguard open trenches in order to alleviate the danger of collapse on people or on equipment and people- especially small children who may fall into it.	Duration	Short term		Ensure that the trenches are dug according to specifications as prescribed by the Civil Engineer.
		Extent	Local	Local	
		Magnitude (Intensity)	Medium	Medium	
		Probability	Definite	Ensure that the trenches stay open for as short a time as possible.	Definite
		Significance	Medium		Medium
		Reversibility	High		High
		Risk	Low	Ensure that open trenches are demarcated as required by the Occupational Health and Safety Act.	Medium
Indirect impacts:					
Geographical Physical Social Economic	Plan to control dust generation from the proposed project which could impact on the surrounding area.	Duration	Short term	Spray water on open surfaces to ensure that dust does not cause air pollution during construction.	Short term
		Extent	Local		Local
		Magnitude (Intensity)	Low		Low
		Probability	Probable	Start the rehabilitation of disturbed surfaces as soon as possible	Probable
		Significance	Medium		Medium
		Reversibility	High		High
		Risk	Low		Medium
	Plan and compile method statements to implement measures for the prevention and or handling of spills of lubricants / oils that can take place on bare soil.	Extent	Local	Prevent spills of lubricants/oils that can take place on bare soil. This will include the use of drip trays for vehicles that are standing for more than 24 hours.	Local
		Magnitude (Intensity)	Low		Low
		Probability	Probable		Probable
		Significance	Medium	Ensure that all construction vehicles are in good working order and not leaking oil and or fuel.	Medium
		Reversibility	High		High
		Risk	Low		Medium
	Plan to provide method statements on the handling of waste materials such as glass, plastic, metal or paper which may present a possible pollution hazard	Extent	Local	Implement the management plan to ensure that: All construction rubble is disposed of in a safe and environmentally acceptable manner. NO concrete, gravel or other rubbish will be allowed to remain on site after the construction phase.	Local
		Magnitude (Intensity)	Low		Low
		Probability	Probable		Probable
		Significance	Medium		Medium
		Reversibility	High	All cement is housed as to prevent spills (due to rain and or handling errors). NO glass, plastic, metal, or paper shall be allowed to pollute the area.	High
		Risk	Low		Medium

ENVIRONMENTAL IMPACT ASSESSMENT (Planning and design phase)						
ALTERNATIVE 1: Mixed land use township (Preferred Alternative)						
Environmental Attribute	Potential impacts and risks	Assessment criteria	Assessment rating (With mitigation)	Proposed mitigation	Assessment rating (Without mitigation)	
	Plan to ensure all involved is aware of the possible social and environmental problems that may be experienced as a result of non- compliance to the relevant legislation.	Extent	Local	Ensure that contractors (construction phase) abide by all the requirements of the Occupational Health and Safety Act. Ensure that all contractors are aware of the consequences of non-compliance to the relevant legislation regarding the above-mentioned act as well as with regard to the environment (acts, regulations, and special guidelines).	Local	
		Magnitude (Intensity)	Medium		Medium	
		Probability	Probable		Probable	
		Significance	Medium		Medium	
		Reversibility	High		High	
		Risk	Low		Medium	
	Plan to create new employment opportunities. Plan to use local labour to ensure local skills development will take place.	Extent	Local	No mitigation measures needed apart from the fact that contractors will have to ensure that they abide to the requirements of the Occupational Health and Safety Act and the Employment Equity Act.	Local	
		Magnitude (Intensity)	Medium		Medium	
		Probability	Definite		Definite	
		Significance	Medium		Medium	
		Reversibility	Medium		Medium	
		Risk	Low		Medium	
	Cumulative impacts:					
	Geographical Physical Social Economic	Plan the development to ensure the social well-being of the community for which the development is intended	Extent	Local	Ensure that the development is constructed as planned. The demand for housing will be partially addressed in the area.	Local
Magnitude (Intensity)			Medium	Medium		
Probability			Definite	Definite		
Significance			Medium	Medium		
Reversibility			Medium	Medium		
Risk			Low	Medium		
Plan to ensure that the services (Solid waste, bulk water supply water, sewage, electricity and storm water) are designed and constructed in such a manner that it will not cause Environmental degradation.		Extent	Local	Appoint a Civil Engineer to assess the availability and design of services to ensure a sustainable development. Ensure that the development is constructed as planned.	Local	
		Magnitude (Intensity)	Medium		Medium	
		Probability	Definite		Definite	
		Significance	High		High	
		Reversibility	High		High	
		Risk	Low		Medium	
Plan for the increase in traffic volumes that will result from the proposed development		Extent	Local	The Town and Regional Planner will have to design the layout of the development in such a way that accessibility will not become a problem.	Local	
		Magnitude (Intensity)	Medium		Medium	
		Probability	Definite		Definite	
		Significance	Medium		High	
		Reversibility	Low		Low	
		Risk	Medium		Medium	
Loss of indigenous vegetation.		Extent	Local	No mitigation measures possible.	Local	
		Magnitude (Intensity)	Medium		Medium	
		Probability	Definite		Definite	
		Significance	High		High	
		Reversibility	Low		Low	
		Risk	Medium		Medium	

ENVIRONMENTAL IMPACT ASSESSMENT (Planning and design phase)					
ALTERNATIVE 2: Single land use: Housing only					
Environmental Attribute	Potential impacts and risks	Assessment criteria	Assessment rating (With mitigation)	Proposed mitigation	Assessment rating (Without mitigation)
DIRECT IMPACTS:					
Geographical Physical	102.3852 hectares of indigenous vegetation have	Duration	Long term	Obtain the necessary environmental authorization for the development.	Long term
		Extent	Local		Local

ENVIRONMENTAL IMPACT ASSESSMENT (Planning and design phase)					
ALTERNATIVE 2: Single land use: Housing only					
Environmental Attribute	Potential impacts and risks	Assessment criteria	Assessment rating (With mitigation)	Proposed mitigation	Assessment rating (Without mitigation)
Social Economic	been eradicated in order to establish the informal development.	Magnitude (Intensity)	High	Conduct a Fauna and Flora Habitat survey to determine the sensitivity of the area. Implement the mitigation measures as described in the Environmental Management Plan.	High
		Probability	Definite		Definite
		Significance	Medium		Medium
		Reversibility	Low		Low
		Risk	Low		Medium
	Plan for the provision of services for the development.	Duration	Long term	Appoint a Civil Engineer to assess the availability and design of services to ensure a sustainable development. A. Site specific Dolomite Risk Management Plan in accordance with SANS 1936-4:2012 must be compiled and implemented for these houses / formal structures in D4 Land. The owners/responsible persons must be made aware of the risks involved in building on dolomite, and be informed about how to be vigilant and act pro-actively by applying sound water management principles. B. General precautionary measures as set out in SANS 1936 Part 3: Design and construction of buildings, structures and infrastructure, must be studied and implemented.	Long term
		Extent	Local		Local
		Magnitude (Intensity)	High		High
		Probability	Definite		Definite
		Significance	Medium		Medium
		Reversibility	Low		Low
		Risk	Medium		Medium
	Plan to rehabilitate disturbed surfaces which can lead to erosion and dust pollution. Prepare method statements to this effect.	Duration	Short term	Start the rehabilitation of disturbed surfaces as soon as possible. Spray bare surfaces with water to prevent dust pollution.	Medium term
		Extent	Local		Local
		Magnitude (Intensity)	Low		Medium
		Probability	Definite		Definite
		Significance	Medium		Medium
		Reversibility	High		High
	Plan for the eradication of foreign and invader plant species which are likely to invade disturbed areas.	Risk	Low		Medium
		Duration	Short term	Start the extermination of any invasive species as soon as possible and maintain the eradication programme.	Medium term
		Extent	Local		Local
		Magnitude (Intensity)	Low		Low
		Probability	Definite		Definite
		Significance	Medium		Medium
	Plan for the provision and maintenance of ablution facilities for construction workers to prevent pollution of surface and underground water.	Reversibility	High		High
		Risk	Low		Medium
		Duration	Short term	Provide portable ablution facilities that will not cause pollution during the construction phase.	Short term
		Extent	Local		Local
		Magnitude (Intensity)	Medium		Medium
		Probability	Definite		Definite
		Significance	Medium		Medium
	Plan to manage possible impacts that the project can have on the soil and geology.	Reversibility	High		High
		Risk	Low		Medium
		Duration	Long term	Properly plan the construction phase in such a manner that impacts on the soil and geology of the area can be minimised. The findings of the Geotechnical Engineer must be incorporated into the design of the project.	Long term
		Extent	Local		Local
		Magnitude (Intensity)	Low		Medium
		Probability	Definite		Definite
		Significance	Medium		Medium
		Reversibility	High		High
		Risk	Low		Medium

ENVIRONMENTAL IMPACT ASSESSMENT (Planning and design phase)					
ALTERNATIVE 2: Single land use: Housing only					
Environmental Attribute	Potential impacts and risks	Assessment criteria	Assessment rating (With mitigation)	Proposed mitigation	Assessment rating (Without mitigation)
Geographical Physical Social Economic	Plan for the removal of vegetation (which will lead to the destruction of faunal and floral habitats) during the construction phase.	Duration	Short term	Plan to prevent spills of lubricants/oils that can take place on bare soil. This will include the use of drip trays for vehicles that are standing for more than 24 hours. The findings of the Geotechnical Engineer must be incorporated into the design of the project.	
		Extent	Local	Plan to prevent spills of lubricants/oils that can take place on bare soil. This will include the use of drip trays for vehicles that are standing for more than 24 hours.	
		Magnitude (Intensity)	Medium		
		Probability	Definite	Start with the rehabilitation of vegetation to minimize the negative effects of the removal of plants.	
		Significance	Medium	The rule must be to minimize the disturbance of animal life by keeping the footprint as small as possible.	
		Reversibility	High		
		Risk	Low	No snares may be set.	
	Plan to safeguard open trenches in order to alleviate the danger of collapse on people or on equipment and people- especially small children who may fall into it.	Duration	Short term	Ensure that the trenches are dug according to specifications as prescribed by the Civil Engineer.	Short term
		Extent	Local		Local
		Magnitude (Intensity)	Medium		Medium
		Probability	Definite	Ensure that the trenches stay open for as short a time as possible.	Definite
		Significance	Medium		Medium
		Reversibility	High		High
		Risk	Low	Ensure that open trenches are demarcated as required by the Occupational Health and Safety Act.	Medium
	Indirect impacts:				
	Plan to control dust generation from the proposed project which could impact on the surrounding area.	Duration	Short term	Spray water on open surfaces to ensure that dust does not cause air pollution during construction.	Short term
		Extent	Local		Local
		Magnitude (Intensity)	Low		Low
		Probability	Probable	Start the rehabilitation of disturbed surfaces as soon as possible	Probable
		Significance	Medium		Medium
		Reversibility	High		High
		Risk	Low		Medium
	Plan and compile method statements to implement measures for the prevention and or handling of spills of lubricants / oils that can take place on bare soil.	Extent	Local	Prevent spills of lubricants/oils that can take place on bare soil. This will include the use of drip trays for vehicles that are standing for more than 24 hours.	Local
		Magnitude (Intensity)	Low		Low
		Probability	Probable		Probable
		Significance	Medium		Medium
		Reversibility	High		High
		Risk	Low	Ensure that all construction vehicles are in good working order and not leaking oil and or fuel. No vehicles may be serviced on site.	Medium
	Plan to provide method statements on the handling of waste materials such as glass, plastic, metal or paper which may present a possible pollution hazard	Extent	Local	Implement the management plan to ensure that:	Local
		Magnitude (Intensity)	Low	All construction rubble is disposed of in a safe and environmentally acceptable manner.	Low
		Probability	Probable	NO concrete, gravel or other rubbish will be allowed to remain on site after the construction phase.	Probable
		Significance	Medium		Medium
		Reversibility	High		High
		Risk	Low		Medium

ENVIRONMENTAL IMPACT ASSESSMENT (Planning and design phase)						
ALTERNATIVE 2: Single land use: Housing only						
Environmental Attribute	Potential impacts and risks	Assessment criteria	Assessment rating (With mitigation)	Proposed mitigation	Assessment rating (Without mitigation)	
Geographical Physical Social Economic	Plan to ensure all involved is aware of the possible social and environmental problems that may be experienced as a result of non- compliance to the relevant legislation.			All cement is housed as to prevent spills (due to rain and or handling errors).		
				NO glass, plastic, metal, or paper shall be allowed to pollute the area.		
		Extent	Local	Ensure that contractors (construction phase) abide by all the requirements of the Occupational Health and Safety Act. Ensure that all contractors are aware of the consequences of non-compliance to the relevant legislation regarding the above-mentioned act as well as with regard to the environment (acts, regulations, and special guidelines).	Local	
		Magnitude (Intensity)	Medium		Medium	
		Probability	Probable		Probable	
		Significance	Medium		Medium	
		Reversibility	High		High	
	Risk	Low	Medium			
	Plan to create new employment opportunities. Plan to use local labour to ensure local skills development will take place.	Extent	Local	No mitigation measures needed apart from the fact that contractors will have to ensure that they abide to the requirements of the Occupational Health and Safety Act and the Employment Equity Act.	Local	
		Magnitude (Intensity)	Medium		Medium	
		Probability	Definite		Definite	
		Significance	Medium		Medium	
		Reversibility	Medium		Medium	
		Risk	Low		Medium	
	Cumulative impacts:					
	Geographical Physical Social Economic	Plan the development to ensure the social well-being of the community for which the development is intended	Extent	Local	Ensure that the development is constructed as planned. The demand for housing will be partially addressed in the area.	Local
			Magnitude (Intensity)	Medium		Medium
Probability			Definite	Definite		
Significance			Medium	Medium		
Reversibility			Medium	Medium		
Risk			Low	Medium		
Plan to ensure that the services (Solid waste, bulk water supply water, sewage, electricity and storm water) are designed and constructed in such a manner that it will not cause Environmental degradation.		Extent	Local	Appoint a Civil Engineer to assess the availability and design of services to ensure a sustainable development. Ensure that the development is constructed as planned.	Local	
		Magnitude (Intensity)	Medium		Medium	
		Probability	Definite		Definite	
		Significance	High		High	
		Reversibility	High		High	
		Risk	Low		Medium	
Plan for the increase in traffic volumes that will result from the proposed development		Extent	Local	The Town and Regional Planner will have to design the layout of the development in such a way that accessibility will not become a problem.	Local	
		Magnitude (Intensity)	Medium		Medium	
		Probability	Definite		Definite	
		Significance	Medium		High	
		Reversibility	Low		Low	
		Risk	Medium		Medium	
Loss of indigenous vegetation.		Extent	Local	No mitigation measures possible.	Local	
		Magnitude (Intensity)	Medium		Medium	
		Probability	Definite		Definite	
	Significance	High	High			
	Reversibility	Low	Low			
	Risk	Medium	Medium			

ENVIRONMENTAL IMPACT ASSESSMENT (Construction phase)					
ALTERNATIVE 1: Mixed land use township (Preferred Alternative)					
Environmental Attribute	Environmental Attribute	Environmental Attribute	Environmental Attribute	Environmental Attribute	Environmental Attribute
DIRECT IMPACTS:					
Geographical Physical Social Economic	102.3852 hectares of indigenous vegetation have been eradicated in order to establish the informal development.	Duration	Long term	Obtain the necessary environmental authorization for the development.	Long term
		Extent	Local		Local
		Magnitude (Intensity)	High		High
		Probability	Definite	Implement the findings of the Fauna and Flora Habitat survey.	Definite
		Significance	Medium		Medium
		Reversibility	Low		Low
		Risk	Low		Medium
	Foreign plant species are likely to invade disturbed areas.	Duration	Short term	Start the extermination of any invasive species as soon as possible and maintain the eradication programme.	Medium term
		Extent	Local		Local
		Magnitude (Intensity)	Low		Low
		Probability	Definite		Definite
		Significance	Medium		Medium
		Reversibility	High		High
		Risk	Low		Medium
	Poorly planned ablution facilities for construction workers may cause pollution of surface and underground water.	Duration	Short term	Provide portable ablution facilities that will not cause pollution during the construction phase.	Short term
		Extent	Local		Local
		Magnitude (Intensity)	Medium		Medium
		Probability	Definite		Definite
		Significance	Medium		Medium
		Reversibility	High		High
		Risk	Low		Medium
	The proposed project can impact on the soil and geology.	Duration	Long term	Implement the findings of the Geo-Technical Engineer.	Long term
		Extent	Local		Local
		Magnitude (Intensity)	Low		Medium
		Probability	Definite	Prevent spills of lubricants/oils that can take place on bare soil. This will include the use of drip trays for vehicles that are standing for more than 24 hours.	Definite
		Significance	Medium		Medium
		Reversibility	High		High
		Risk	Low		Medium
	The vegetation of the area will be removed during the construction phase, which will destroy floral and faunal habitats.	Duration	Short term	Start with the rehabilitation of vegetation to minimize the negative effects of the removal of plants.	Short term
		Extent	Local		Local
		Magnitude (Intensity)	Medium		Medium
		Probability	Definite	The rule must be to minimize the disturbance of animal life by keeping the footprint as small as possible.	Definite
		Significance	Medium		Medium
		Reversibility	High		High
		Risk	Low		Medium
	Open trenches can be dangerous as they can either collapse on people or on equipment and people- especially small children, can fall into it.	Duration	Short term	Ensure that the trenches are dug according to specifications as prescribed by the Civil Engineer.	Short term
		Extent	Local		Local
		Magnitude (Intensity)	Medium		Medium
		Probability	Definite		Definite
		Significance	Medium		Medium
		Reversibility	High		High
		Risk	High		High

ENVIRONMENTAL IMPACT ASSESSMENT (Construction phase)					
ALTERNATIVE 1: Mixed land use township (Preferred Alternative)					
Environmental Attribute	Environmental Attribute	Environmental Attribute	Environmental Attribute	Environmental Attribute	Environmental Attribute
		Risk	Low	<p>Ensure that the trenches stay open for as short a time as possible.</p> <p>Ensure that open trenches are demarcated as required by the Occupational Health and Safety Act.</p>	Medium
Indirect impacts:					
Geographical Physical Social Economic	Dust generation from the proposed project could impact on the surrounding area.	Duration	Short term	<p>Spray water on open surfaces to ensure that dust does not cause air pollution during construction.</p> <p>Start the rehabilitation of disturbed surfaces as soon as possible</p>	Short term
		Extent	Local		Local
		Magnitude (Intensity)	Low		Low
		Probability	Probable		Probable
		Significance	Medium		Medium
		Reversibility	High		High
		Risk	Low		Medium
	Spills of lubricants / oils can take place on bare soil.	Extent	Local	<p>Prevent spills of lubricants/oils that can take place on bare soil. This will include the use of drip trays for vehicles that are standing for more than 24 hours.</p> <p>Ensure that all construction vehicles are in good working order and not leaking oil and or fuel. No vehicles may be serviced on site.</p>	Local
		Magnitude (Intensity)	Low		Low
		Probability	Probable		Probable
		Significance	Medium		Medium
		Reversibility	High		High
		Risk	Low		Medium
	Waste materials such as glass, plastic, metal or paper present a possible pollution hazard	Extent	Local	<p>Implement the management plan to ensure that:</p> <p>All construction rubble is disposed of in a safe and environmentally acceptable manner. NO concrete, gravel or other rubbish will be allowed to remain on site after the construction phase.</p> <p>All cement is housed as to prevent spills (due to rain and or handling errors).</p> <p>NO glass, plastic, metal, or paper shall be allowed to pollute the area.</p>	Local
		Magnitude (Intensity)	Low		Low
		Probability	Probable		Probable
		Significance	Medium		Medium
		Reversibility	High		High
		Risk	Low		Medium
	Non-compliance to the relevant legislation may cause social and environmental problems.	Extent	Local	<p>Ensure that contractors (construction phase) abide by all the requirements of the Occupational Health and Safety Act.</p>	Local
		Magnitude (Intensity)	Medium		Medium
		Probability	Probable		Probable
		Significance	Medium		Medium
		Reversibility	High		High
		Risk	Low		Medium

ENVIRONMENTAL IMPACT ASSESSMENT (Construction phase)					
ALTERNATIVE 1: Mixed land use township (Preferred Alternative)					
Environmental Attribute	Environmental Attribute	Environmental Attribute	Environmental Attribute	Environmental Attribute	Environmental Attribute
	New employment opportunities will be created. Local skills development will take place.			Ensure that all contractors are aware of the consequences of non-compliance to the relevant legislation regarding the above-mentioned act as well as with regard to the environment (acts, regulations, and special guidelines).	
		Extent	Local	No mitigation measures needed apart from the fact that contractors will have to ensure that they abide to the requirements of the Occupational Health and Safety Act and the Employment Equity Act.	
		Magnitude (Intensity)	Medium		
		Probability	Definite		
		Significance	Medium		
		Reversibility	Medium		
		Risk	Low		
Cumulative impacts:					
Geographical Physical Social Economic	Enhancement of the social well-being of the local communities for which the development is intended	Extent	Local	Ensure that the development is constructed as planned.	Local
		Magnitude (Intensity)	Medium		Medium
		Probability	Definite		Definite
		Significance	Medium		Medium
		Reversibility	Medium		Medium
		Risk	Low		Medium
	<u>Solid waste:</u> The proposed development will add additional solid waste into the existing waste stream of the Thembelihle Local Municipality.	Extent	Local	Ensure that the development is constructed as planned by the Civil Engineer.	Local
		Magnitude (Intensity)	Medium		Medium
		Probability	Definite		Definite
		Significance	High		High
		Reversibility	High		High
		Risk	Low		
	<u>Sewage:</u> The proposed development will add additional sewage into the existing sewage stream of the Thembelihle Local Municipality.				
		<u>Water supply:</u> The proposed development will add pressure to the water supply of Thembelihle Local Municipality's Water.			
	<u>Traffic:</u> The proposed development will result in an increase in traffic in the immediate surroundings of the proposed development.	Extent	Local	Ensure that the development is constructed as planned by the Town and Regional Planner	Local
		Magnitude (Intensity)	Medium		Medium
		Probability	Definite		Definite
		Significance	Medium		High
		Reversibility	Low		Low
		Risk	Medium		Medium
	Indigenous vegetation will be removed.	Extent	Local	No mitigation measures possible.	Local
		Magnitude (Intensity)	Medium		Medium
Probability		Definite	Definite		
Significance		High	High		
Reversibility		Low	Low		
Risk		Medium	Medium		
Extent		Local	Local		

ENVIRONMENTAL IMPACT ASSESSMENT (Operational Phase)					
ALTERNATIVE 1: Mixed land use township (Preferred Alternative)					
Environmental Attribute	Environmental Attribute	Environmental Attribute	Assessment rating (With mitigation)	Proposed mitigation	Assessment rating (Without mitigation)
DIRECT IMPACTS:					
Geographical Physical Social Economic Cultural	Poorly maintained and serviced infrastructure may cause environmental problems.	Extent	Local	It will be the responsibility of the Local Municipality to maintain the infrastructure.	Local
		Magnitude (Intensity)	Medium		Medium
		Probability	Definite		Definite
		Significance	Medium- high		High
		Reversibility	High		Medium
		Risk	High		High
Indirect impacts:					
Geographical Physical Social Economic Cultural	Lack of rehabilitation may cause problems	Extent	Local	It will be the responsibility of the Local Municipality to ensure that the rehabilitation plan is implemented	Local
		Magnitude (Intensity)	Medium		Medium
		Probability	Definite		Definite
		Significance	Medium- high		High
		Reversibility	High		Medium
		Risk	High		High
Cumulative impacts:					
Geographical Physical Social Economic Cultural	Enhancement of the social well-being of the local communities for which the development is intended	Extent	Local	No mitigation measures required.	Local
		Magnitude (Intensity)	Medium		Medium
		Probability	Definite		Definite
		Significance	High		High
		Reversibility	High		High
		Risk	Medium		Medium
Geographical Physical Social Economic Cultural	Broadened tax base: The proposed development will generate more income for the Thembelihle Local Municipality.	Extent	Local	No mitigation measures required.	Local
		Magnitude (Intensity)	Medium		Medium
		Probability	Definite		Definite
		Significance	High		High
		Reversibility	High		High
		Risk	Medium		Medium

APPENDIX I:

PUBLIC PARTICIPATION

APPENDIX I.1:

NEWSPAPER ADVERTISEMENT AND SITE NOTICES

PROOF OF SITE NOTICE AFFIXED IN LINE WITH COVID-19 PROTOCOL: PROTECTIVE GEAR (MASK & GLOVES) AND SANITIZATION IN PLACE: 09/12/2020









**NOTICE OF APPLICATION TO RECTIFY UNLAWFUL COMMENCEMENT OR RECTIFICATION OF
UNLAWFUL COMMENCEMENT OR CONTINUATION OF LISTED ACTIVITIES IN TERMS OF SECTION
24G OF THE NATIONAL ENVIRONMENTAL MANAGEMENT ACT (NO 107 OF 1998) AS AMENDED
REF: S24G01/03/2020**

Notice is hereby given of an application that has been submitted to the Northern Cape Province: Department of Environment and Nature Conservation to rectify an unlawful commencement of a listed activity in terms of Section 24G of the National Environmental Management Act (no 107 of 1998) as amended. The activity is classified in terms of Government Notice No. R.325 (Listing Notice 1, Activity 15) of 2014 as amended 7 April 2017.

This advertisement complies with the instructions regarding such notices, National Environmental Management Act (Act No. 107 of 1998, as amended) (Regulations promulgated on 04 December 2014), amended: (Government Notice No. R.326 of 2017) (Regulation 41(2)(c)(d)). The competent authority is the Northern Cape Province: Department of Environment and Nature Conservation

PROJECT TITLE:

Legalization of the commencement of the clearance of 102.3852 ha of indigenous vegetation in order to formalise a township, currently known as the informal settlements of Goutrou and Hillside, situated on a Portion of the Remaining Extent of Erf 1, Hopetown, within the Thembelihle Local Municipality, Northern-Cape Province.

PROJECT DESCRIPTION:

The formalisation of a township, known as the informal settlements of Goutrou and Hillside which will consist of a mixed use township including business, residential, church, crèche, primary school and municipal buildings and parks.

LOCATION:

A Portion of the Remaining Extent of Erf 1, Hopetown, within the Thembelihle Local Municipality, Northern-Cape Province.

CLIENT:

Thembelihle Local Municipality in association with the Department of Co-operative Governance, Human Settlements and Traditional Affairs of the Northern Cape (COGHSTA)

CONSULTANT AND CONTACT PERSON:

Mrs. JE (Hannie) du Plooy
AB Enviro Consult CC
7 Louis Leipoldt Street, POTCHEFSTROOM, 2531
Tel: 071 202 4027 / Fax: 018 293 0671 / E-mail: hannieduplooy@abenviro.co.za

Parties wishing to formally object to and / or comment on the proposed development are requested to forward their objections and comments (with reasons) to AB Enviro Consult, by no later than the 30th January 2021. A copy of the draft Report is also available from AB Enviro Consult on request.

APPENDIX I.2:

PROOF OF KEY STAKEHOLDER NOTIFICATIONS

**PROOF OF COVID-19 APPROVED PUBLIC PARTICIPATION PROTOCOLS AS WELL AS PROOF
OF LETTER DROP:**











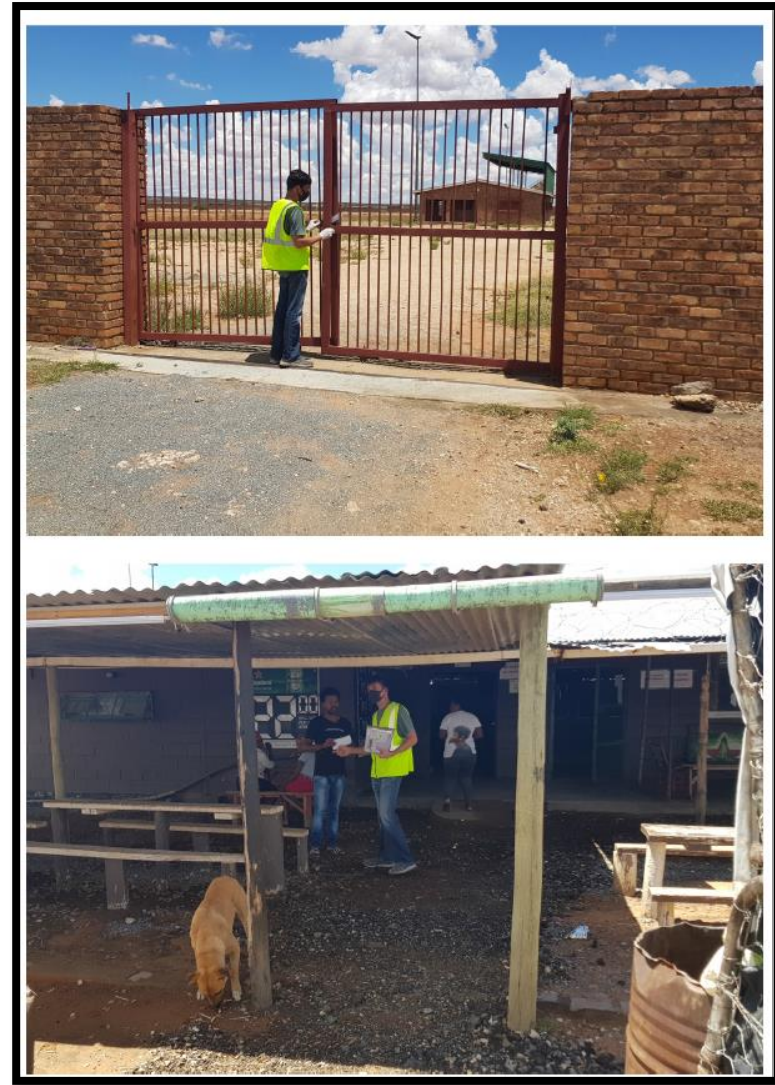














APPENDIX I.3:
COMMENTS AND RESPONSE REPORT
TO FOLLOW

APPENDIX I.4:
PROOF OF WRITTEN NOTIFICATION AND DRAFT REPORTS SENT TO
AUTHORITIES AND ORGANS OF STATE

List of REGISTERED LETTERS Lys van GEREGETSTREERDE BRIEWE

(with an insurance option/met 'n versekeringsopsie)

Full tracking and tracing/Volledige volg en spoor

Name and address of sender: F. B. Enviro Consult
Naam en adres van afsender: Thouis Leipoldts Street
Potchefstroom 2531



Post Office

Enquiries/Navrae
Sharecall
number/nommer

0860 111 502
www.postoffice.co.za

No	Name and address of addressee Naam en adres van geadreseerde	Insured amount Versekerde bedrag	Insurance fee Versoke- ringsgeld	Postage Posgeld	Service fee Diensgeld	Affix Track and Trace customer copy Plak Volg-en-Spoor- Kliëntatskrif
1	Thembelile Local Mun. The Mun. Manager Mr. M.B. Jack Private Bag X3 Hopetown 8750					REGISTERED LETTER with a domestic insurance option ShareCall 0860 111 502 www.postoffice.co.za RC458600675ZA CUSTOMER COPY 301028R
2	N.C. Dept. of Agric. Land Reform Rural Dev. H.O.D. Mr. V. Mthibane Private Bag X0013, Kimberley 8300					REGISTERED LETTER with a domestic insurance option ShareCall 0860 111 502 www.postoffice.co.za RC458600684ZA CUSTOMER COPY 301028R
3	N.C. Dept. of Environment Nature Conservation Biodiversity Man. Services Mr. Dewald Boshoff Private Bag X6126 Kimberley 8301					REGISTERED LETTER with a domestic insurance option ShareCall 0860 111 502 www.postoffice.co.za RC458600619ZA CUSTOMER COPY 301028R
4	N.C. Dept. of Agric. Land Reform F.H.O. J. Mans P.O. Box 2782, Upington 8800					REGISTERED LETTER with a domestic insurance option ShareCall 0860 111 502 www.postoffice.co.za RC458600622ZA CUSTOMER COPY 301028R
5	Thembelile Local Mun. The Mun. Manager Mr. R.E. Picters Private Bag X3, Hopetown 8750					REGISTERED LETTER with a domestic insurance option ShareCall 0860 111 502 www.postoffice.co.za RC458600586ZA CUSTOMER COPY 301028R
6	Thembelile Local Mun. The Ward Councillor Ward 2 Private Bag X3 Hopetown 8750					REGISTERED LETTER with a domestic insurance option ShareCall 0860 111 502 www.postoffice.co.za RC458600585ZA CUSTOMER COPY 301028R
7	S. A. Civil Aviation Authority Mr. Nivashnee Naraindath Private Bag X3 Halfway House 1680					REGISTERED LETTER with a domestic insurance option ShareCall 0860 111 502 www.postoffice.co.za RC458600579ZA CUSTOMER COPY 301028R
8	Thembelile Local Mun. The Ward Councillor Ward 4 Private Bag X3 Hopetown 8750					REGISTERED LETTER with a domestic insurance option ShareCall 0860 111 502 www.postoffice.co.za RC458600582ZA CUSTOMER COPY 301028R
9	Northern C. Dept. Roads & Public Works The Director Roads P.O. Box 3132 Kimberley 8300					
10						

Number of letters posted
Getal briewe gepos

9/NINE
Totaal

R R R R

Signature of client

Handtekening van kliënt

Signature of accepting officer

Handtekening van aanneembeampte

The value of the contents of these letters is as indicated and compensation is not payable for a letter received unconditionally. Compensation is limited to R100.00. No compensation is payable without documentary proof.

Optional insurance of up to R200.00 is available and applies to domestic registered letters only.

Die waarde van die inhoud van hierdie briewe is soos aangedui en vergoeding sal nie betaal word vir 'n brief

Date stamp





AB ENVIRO-CONSULT CC

Reg no. 2000/016653/23

7 Louis Leipoldt Street,
Potchefstroom, 2531
Fax: + 27 (18) 293 0671
Cell: + 27 (71) 202 4027
hannieduplooy@abenviro.co.za

10/12/2020

Department of Water and Sanitation
The Registry: Consultation on EIA applications
Louisvale Road
Upington
8800

Tel: 054 338 5800

Dear Sir/Madam

Legalization of the commencement of the clearance of 102.3852 ha of indigenous vegetation in order to formalise a township, currently known as the informal settlements of Goutrou and Hillside, situated on a Portion of the Remaining Extent of Erf 1, Hopetown, within the Thembelihle Local Municipality, Northern-Cape Province.

AB ENVIRO CONSULT was appointed by Thembelihle Local Municipality in association with the Department of Co-operative Governance, Human Settlements and Traditional Affairs of the Northern Cape (COGHSTA) to submit an application to the Northern Cape Province Department: Environment and Nature Conservation for the above mentioned proposed development.

Please find enclosed a copy of the Section 24G report. We must receive your comments by no later than the 30th January 2021. In the event of your organisation/department not wishing to comment on this matter, it would be appreciated if we could receive written confirmation thereof to enable us to continue with the finalisation of the application.

If no response is however received from your Department/organisation within the said time, it will be assumed that your department/organisation does not wish to comment on this matter and the application will be processed further.

Please do not hesitate to contact us should any further information or clarification be required.

Yours sincerely,

PROF. A.B. DE VILLIERS

PROF A B DE VILLIERS (M Sc, Ph D, SACNASP)
MR.J.P. DE VILLIERS (M Sc, HED, EAP-EAPASA); MRS.J.E. DU PLOOY (M.E.M; EAP-EAPASA)



7 Louis Leipoldt Street,
Potchefstroom, 2531
Fax: + 27 (18) 293 0671
Cell: + 27 (71) 202 4027
hannieduplooy@abenviro.co.za

AB ENVIRO-CONSULT CC

Reg no. 2000/016653/23

10/12/2020

Northern Cape Department of Agriculture and Land Reform and Rural Development
HOD, Mr. V. Mothibi
Private Bag X5018
Kimberley
8300

Dear Sir/Madam

Legalization of the commencement of the clearance of 102.3852 ha of indigenous vegetation in order to formalise a township, currently known as the informal settlements of Goutrou and Hillside, situated on a Portion of the Remaining Extent of Erf 1, Hopetown, within the Thembelihle Local Municipality, Northern-Cape Province.

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Please do not hesitate to contact us should any further information or clarification be required.

Yours sincerely,

PROF. A.B. DE VILLIERS

PROF A B DE VILLIERS (M Sc, Ph D, SACNASP)
MR.J.P. DE VILLIERS (M Sc, HED, EAP-EAPASA); MRS.J.E. DU PLOOY (M.E.M; EAP-EAPASA)



AB ENVIRO-CONSULT CC

Reg no. 2000/016653/23

7 Louis Leipoldt Street,
Potchefstroom, 2531
Fax: + 27 (18) 293 0671
Cell: + 27 (71) 202 4027
hannieduplooy@abenviro.co.za

10/12/2020

Northern Cape Department of Environment and Nature conservation
Biodiversity Management services
Mr. Dewald Badenhorst
Private Bag X6120
Kimberley
8301

Dear Sir/Madam

Legalization of the commencement of the clearance of 102.3852 ha of indigenous vegetation in order to formalise a township, currently known as the informal settlements of Goutrou and Hillside, situated on a Portion of the Remaining Extent of Erf 1, Hopetown, within the Thembelihle Local Municipality, Northern-Cape Province.

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hannieduplooy@abenviro.co.za

10/12/2020

Northern Cape Department of Agriculture, Forestry and Fisheries
FAO: J. Mans
P.O. Box 2782
Upington
8800

Dear Sir/Madam

Legalization of the commencement of the clearance of 102.3852 ha of indigenous vegetation in order to formalise a township, currently known as the informal settlements of Goutrou and Hillside, situated on a Portion of the Remaining Extent of Erf 1, Hopetown, within the Thembelihle Local Municipality, Northern-Cape Province.

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Cell: + 27 (71) 202 4027
hannieduplooy@abenviro.co.za

10/12/2020

Northern Cape Department Roads and Public Works
The Director: Roads
PO Box 3132
Kimberley
8300

Dear Sir/Madam

Legalization of the commencement of the clearance of 102.3852 ha of indigenous vegetation in order to formalise a township, currently known as the informal settlements of Goutrou and Hillside, situated on a Portion of the Remaining Extent of Erf 1, Hopetown, within the Thembelihle Local Municipality, Northern-Cape Province.

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Potchefstroom, 2531
Fax: + 27 (18) 293 0671
Cell: + 27 (71) 202 4027
hannieduplooy@abenviron.co.za

10/12/2020

Pixley Ka Seme District Municipality
The Municipal Manager:
Mr. RE Pieterse
Private Bag X3
Hopetown
8750

Dear Sir/Madam

Legalization of the commencement of the clearance of 102.3852 ha of indigenous vegetation in order to formalise a township, currently known as the informal settlements of Goutrou and Hillside, situated on a Portion of the Remaining Extent of Erf 1, Hopetown, within the Thembelihle Local Municipality, Northern-Cape Province.

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hannieduplooy@abenviro.co.za

10/12/2020

Thembelihle Local Municipality
The Municipal Manager:
Mr. MR Jack
Private Bag X3
Hopetown
8750

Dear Sir/Madam

Legalization of the commencement of the clearance of 102.3852 ha of indigenous vegetation in order to formalise a township, currently known as the informal settlements of Goutrou and Hillside, situated on a Portion of the Remaining Extent of Erf 1, Hopetown, within the Thembelihle Local Municipality, Northern-Cape Province.

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Patchesfontein, 2531
Fax: + 27 (18) 293 0671
Cell: + 27 (71) 202 4027
hannieduplooy@abenviro.co.za

10/12/2020

Thembelihle Local Municipality
The Ward Councillor: Ward 2
Private Bag X3
Hopetown
8750

Dear Sir/Madam

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hannieduplooy@abenviro.co.za

10/12/2020

Thembelihle Local Municipality
The Ward Councillor: Ward 4
Private Bag X3
Hopetown
8750

Dear Sir/Madam

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hannieduplooy@abenviro.co.za

10/12/2020

South African Civil Aviation Authority (SACAA)
Ms Nivashnee Naraindath (Company Secretary and Executive Manager)
Private Bag X73
Halfway House
1685

Dear Sir/Madam

Legalization of the commencement of the clearance of 102.3852 ha of indigenous vegetation in order to formalise a township, currently known as the informal settlements of Goutrou and Hillside, situated on a Portion of the Remaining Extent of Erf 1, Hopetown, within the Thembelihle Local Municipality, Northern-Cape Province.

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APPENDIX I.5:
LIST OF REGISTERED I&APs
(TO FOLLOW)

APPENDIX I.6:
COPIES OF CORRESPONDENCE RECEIVED / MINUTES OF
MEETINGS
(TO FOLLOW)

APPENDIX J: ENVIRONMENTAL MANAGEMENT PROGRAMME (EMPR)

APPENDIX K: DETAILS OF EAP AND EXPERTISE

COMPANY PROFILE

DETAILS AND EXPERTISE OF THE ENVIRONMENTAL ASSESSMENT

PRACTITIONERS

AB Enviro Consult (CC) is a registered consultancy, owned and operated as an independent unit by the registered owner and consultant: **Prof. A.B. de Villiers**

- **Mr J.P. De Villiers** joined the consultancy during 2004
- **Mrs J.E. du Plooy** is a consultant since 2001

PERSONAL PARTICULARS AND CAREER HISTORY OF PROF DE VILLIERS

Name : ABRAHAM BAREND (BRAAM) DE VILLIERS

Date of birth : 1944/01/26

Telephone : (018) 294-5005

Fax : (018) 293-0671

Electronic mail : brama@abenviro.co.za

Address : 7 LOUIS LEIPOLDT STREET

POTCHEFSTROOM

2531

Lecturer & Professor – Potchefstroom University 1969- 2004

ACADEMIC AND PROFESSIONAL QUALIFICATIONS

Post-Matric Qualifications

<u>YEAR</u>	<u>Qualification</u>	<u>Institution</u>	<u>Field of Study</u>
1968	B.Sc.	PU FOR CHE	Geography, Geology
1970	HONNS. B.Sc.	PU FOR CHE	Soil Science
1974	M.Sc.	PU FOR CHE	Geography
1981	Ph.D.	UOFS	Geography

PROFESSIONAL QUALIFICATIONS AND REGISTRATIONS

<u>YEAR</u>	<u>Qualification/ Registration</u>	<u>Institution</u>	<u>Field of Study</u>
1986	Professional Natural Scientist	S.A. Council for Natural Scientific Professions (400099/86)	Environmental Science
1994	Quality Auditor	ESKOM	Auditing
1998	Personnel & Verifying Auditor	SAATCA	Environmental Auditing
2006-2017	Environmental Assessment Practitioner	Interim Certification Board EAPSA	Environmental Science

MEMBERSHIP AND PARTICIPATION IN SOCIETIES, COUNCILS, ETC.

Name of professional societies	YEAR	Capacity
S.A. Geographical Society.	1967-1996	Board Member
Society for Geography	1968-2004	Member
SAGS Western Transvaal	1985-1989 1987-1989 1996	Chairman
Africa Geographical Association	1993-1995	Vice-President.
Society for the Vaal River Catchment	1980-1999	Member
S.A. Society for Photogrammetry, Remote Sensing and Cartography	1984-1996	Member
Dendrological Society	1986-2005	Member
Birdlife South Africa	2003-present	Member

British Geomorphological Research Group	1985-1997	Member
Int Com on Water Resource Systems	1985-1997	Member
Int Com on Continental Erosion	1986-1990	Member
Int Com on Remote Sensing and Data Transmission	1986-1991	Member
Society for S.A. Geographers	1995-2005	Member
SA Photogrammetrical and Geo. Info.	1995-2003	Member
S.A. Association of Geomorphologists	1994-1999	Board Member and member
SADC Mine Dump Study Group	1996-2005	Member

***Chairman of the Committee for Interested and Affected Parties (CIP) (2004-2008)** for International Accreditation by the influential accrediting body of **Price, Waterhouse Coopers-International Environmental Auditors in Southern Africa.**

Member of Price Waterhouse Coopers CIP (2004-2010)

2.1. ACADEMIC COURSES TAUGHT AT POST-MATRIC LEVEL

1.1 The Geography of Economic Activities and Regional Geography (3rd year and honours students)

1.2 Weather and Climate (1st, 2nd, and 3rd year students)

1.3 Geomorphology (1st year up to PhD level)

1.4 Remote Sensing and the Environment (3rd year and Honours)

1.5 Quantitative Geography (3rd year up to Masters Level)

1.6 Environmental Management (2nd year, up to PhD level)

1.7 Environmental Analysis (3rd year and up to Masters Level)

1.8 Geography of Soil (3rd year and Honours)

1.9 Cartography (1st year to Honours)

1.10 As professor, 26 Masters & 4 PhD D students completed their studies in environmentally related subjects under his tutor- and co-tutorship.

2.2 INVOLVEMENT IN COURSES AND WORKSHOPS

2.2.1 ENVIRONMENTAL COURSES: Partially responsible for course development and taught various courses for environmental officers employed by the North West Province over a period of 3 years (1998-2001). These courses were aimed at improving their knowledge of the environment as well as their understanding of the environmental interactions specifically related to the North West province.

2.2.2 STATE OF THE ENVIRONMENT REPORT (SOE) Involved in the first SOE prepared by the North West Province and was responsible for most of the physical geographical aspects (1999).

2.3 ENVIRONMENTAL PROJECTS

The following projects are typical examples, of such projects which he co-ordinated and managed:

2.3.1 MOOI RIVER CATCHMENT STUDIES: This was a study on the impacts of the mining activities on the quality and quantity of water in the Mooi River catchments and was done for the North West Province. He co-ordinated and managed this project. The team consisted of a PhD student as well as two teams of local and international students; one responsible for the biophysical variables, and the other for socio-cultural aspects.

2.3.2 SADC MINE DUMPS STUDY GROUP: Acted as co-ordinator for the formulation of tools to assess the effects of mine dumps on the environment in the SADC region. One group was involved in the Zimbabwean copper belt region, and the other in the Tanzanian gold mining area. The studies were undertaken for the Carl Duisburg Gesellschaft (Germany). The research team consisted of geographers, ecologists and mining experts. From this study, a pilot program, the “South African Environmental Management System” (SEMS) developed, which was applied successfully by a team of researchers in a pilot study in the Carletonville region.

2.3.3 SADC DEVELOPMENT OF TRAINING MODULES FOR ENVIRONMENTAL STUDIES USING GIS: Member of the three-person team who developed these training modules. It was applied at the Copper belt University, the University of Dar Es Salaam as well as at the Potchefstroom University as an introduction to the integration of environmental data (both biophysical and socio-economic) for the interpretation of geographical regions.

2.3.4 ENVIRONMENTAL DEGRADATION - THE RESULT OF INDISCRIMINATE LOCATION OF SLIME DAMS IN THE SADC REGION: Co-ordinated this study in the Far West Rand Area; conducted case studies in Zambia and South Africa. The team consisted of researchers from the Netherlands, Germany, Zambia and Tanzania.

2.3.5 LAND USE CHANGES IN THE NORTH WEST PROVINCE: An Environmental Management Support System for SOE North-West University Team leader. This project was undertaken for DACE (NWP) and various students participated – each involved in a specific aspect of the environment. This data was co-ordinated and eventually incorporated into the SOE report.

2.4 RESEARCH PUBLICATIONS AND CONFERENCES

He published 11 environmentally related articles in peer-reviewed magazines, and appeared professionally at 30 conferences with a direct bearing on environmental work.

ACADEMIC AND PROFESSIONAL QUALIFICATIONS MR J.P. DE VILLIERS

YEAR	Qualification	Institution	Field of Study
1993	BA	PU FOR CHE	Geography, Economics
1994	HED	PU FOR CHE	Geography Economics
2006	B.Sc.(Honns) Cum Laude	North-West University	Environmental Management
2007	M.Sc.	North-West University	Geography

PROFESSIONAL QUALIFICATIONS AND REGISTRATIONS

YEAR	Qualification/ Registration	Institution	Field of Study
2008	Basic Principles of Ecological Rehabilitation and Mine Closure	Centre for Environmental Management (North West University)	Ecological Rehabilitation
2019	Registered Environmental Assessment Practitioner 2019/808	Environmental Assessment Practitioners of South Africa	

ACADEMIC AND PROFESSIONAL QUALIFICATIONS MRS J.E. DU PLOOY

YEAR	Qualification	Institution	Field of Study
1999	BA	PU FOR CHE	Geography, Tourism
2000	BA (Honns) Cum Laude	PU FOR CHE	Geography

2003	Masters degree in Environmental Management	PU FOR CHE	Environmental Management
2001	Aquabase Intro	AQUABASE	Hydrology
2001	Geomedia Professional	INTERTECH	GIS
2001	Map Info	SPATIAL TECHNOLOGY	GIS

PROFESSIONAL QUALIFICATIONS AND REGISTRATIONS

<u>YEAR</u>	<u>Qualification/ Registration</u>	<u>Institution</u>
2020	Registered Environmental Assessment Practitioner 2019/1573	Environmental Assessment Practitioners of South Africa

EXPERIENCE OF THE CONSULTANCY

Over a period of 24 years (1996-2020) this consultancy has successfully applied for, and obtained positive ROD's and EA's for more than 375 projects. Environmental Control Officer's duties are also performed on various projects.

The company was involved (from 1992-1994) in evaluation of 114 applications for the subdivision of land, 23 applications for resort developments, and 54 applications for business rights for the Department of Agriculture, Conservation and the Environment - North West Province.

The consultancy is qualified to undertake professional studies in waste management and is still involved in the development of waste disposal- (solid and liquid effluent), and emission studies. These studies are conducted both academically and practically. This work relates to mine waste, domestic waste and effluent as well as to the monitoring of waste disposal. Environmental audits in this respect are undertaken on a regular basis

**APPENDIX L:
PROOF THAT THE S24G HAS BEEN
SENT TO DW&S**

