DRAFT BASIC ASSESSMENT REPORT

FOR PUBLIC COMMENT

PROPOSED TOWNSHIP DEVELOPMENT ON ERF 113, GARIEP, !KHEIS LOCAL MUNICIPALITY

OCTOBER 2020

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PROPOSED TOWNSHIP DEVELOPMENT ON ERF 113, GARIEP, !KHEIS LOCAL MUNICIPALITY, NORTHERN CAPE

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Basic Assessment Report in terms of the Environmental Impact Assessment Regulations, 2014 (as amended), promulgated in terms of the National Environmental Management Act, 1998 (Act No. 107 of 1998), as amended

Kindly note that:

- This **basic assessment report** is a standard report that may be required by a competent authority in terms of the EIA Regulations, 2014 and is meant to streamline applications. Please make sure that it is the report used by the particular competent authority for the activity that is being applied for.
- This report format is current as of **08 December 2014**. It is the responsibility of the applicant to ascertain whether subsequent versions of the form have been published or produced by the competent authority
- The report must be typed within the spaces provided in the form. The size of the spaces provided is not necessarily indicative of the amount of information to be provided. The report is in the form of a table that can extend itself as each space is filled with typing.
- Where applicable **tick** the boxes that are applicable in the report.
- An incomplete report may be returned to the applicant for revision.
- The use of "not applicable" in the report must be done with circumspection because if it is used in respect of material information that is required by the competent authority for assessing the application, it may result in the rejection of the application as provided for in the regulations.
- This report must be handed in at offices of the relevant competent authority as determined by each authority.
- No faxed or e-mailed reports will be accepted.
- The signature of the EAP on the report must be an original signature.
- The report must be compiled by an independent environmental assessment practitioner.
- Unless protected by law, all information in the report will become public information on receipt by the competent authority. Any interested and affected party should be provided with the information contained in this report on request, during any stage of the application process.
- A competent authority may require that for specified types of activities in defined situations only parts of this report need to be completed.
- Should a specialist report or report on a specialised process be submitted at any stage for any part of this application, the terms of reference for such report must also be submitted.

SECTION A: ACTIVITY INFORMATION

Has a specialist been consulted to assist with the completion of this section? **YES ✓** | NO

If YES, please complete the form entitled "Details of specialist and declaration of interest" for the specialist appointed and attach in Appendix I.

1) ACTIVITY DESCRIPTION

a) Describe the project associated with the listed activities applied for

The !Kheis Local Municipality is proposing that a new township development, consisting of approximately 135 erven and associated infrastructure on Erf 113, Gariep. Gariep is located approximately 36km north-west of Groblershoop, on the eastern side of the Orange River, in the !Kheis Local Municipality, Northern Cape.

The proposed project entails the development of approximately 135 low income erven, including associated infrastructure such as roads, water, stormwater, effluent and electricity reticulation. The total area to be developed measures approximately 15 hectares (ha).

Site co-ordinates: 28°36'39.33"S; 21°46'53.37"E.

Environmental Requirements

The National Environmental Management Act (NEMA, Act 107 of 1998), as amended, makes provision for the identification and assessment of activities that are potentially detrimental to the environment and which require authorisation from the competent authority based on the findings of an Environmental Assessment. NEMA is a national act, which is enforced by the Department of Environmental Affairs (DEA). In the Northern Cape, these powers are delegated to the Department of Environment and Nature Conservation (DE&NC). According to the regulations of Section 24(5) of NEMA, authorisation is required for the following:

Government Notice R327 (Listing Notice 1):

Activity No. 9: *The development of infrastructure exceeding 1000 metres in length for the bulk transportation of water or storm water;*
(i) with an internal diameter of 0,36 metres or more; or
(ii) with a peak throughput of 120 litres per second or more;

excluding where;

a) such infrastructure is for bulk transportation of water or storm water or storm water drainage inside a road reserve or railway line reserve; or
b) where such development will occur within an urban area.

Activity No. 10: *The development and related operation of infrastructure exceeding 1000 metres in length for the bulk transportation of sewage, effluent, process water, waste water, return water, industrial discharge or slimes*
(i) with an internal diameter of 0,36 metres or more; or
(ii) with a peak throughput of 120 litres per second or more;

excluding where;

(a) such infrastructure is for the bulk transportation of sewage, effluent, process water, waste water, return water, industrial discharge or slimes inside a road reserve or railway line reserve; or
(b) *where such development will occur within an urban area.*

Activity No. 12:

The development of;
(i) dams or weirs, where the dam or weir, including infrastructure and water surface area, exceeds 100 square metres;
(ii) infrastructure or structures with a physical footprint of 100 square metres or more;

where such development occurs;
(a) within a watercourse;
(b) in front of a development setback; or
(c) if no development setback exists, within 32 metres of a watercourse, measured from the edge of a watercourse;

The proposed development includes the development of new infrastructure which will exceed 100m^2 and is located less than 32m from a watercourse.

Activity No 19:

The infilling or depositing of any material of more than 10 cubic metres into, or the dredging, excavation, removal or moving of soil, sand, shells, shell grit, pebbles or rock of more than 10 cubic metres from a watercourse;

(a) will occur behind a development setback;
(b) is for maintenance purposes undertaken in accordance with a maintenance management plan; or
(c) falls within the ambit of activity 21 in this Notice, in which case that activity applies.

The proposed development is located adjacent to an existing watercourse (ephemeral stream) where the watercourse touches the boundary of the eastern and southern section of the proposed site for development. The watercourse will be infilled and/or excavated during construction.

Activity No. 24:

The development of a road;

(i) for which an environmental authorisation was obtained for the route determination in terms of activity 5 in Government Notice 387 of 2006 or activity 18 in Government Notice 545 of 2010; or

(ii) with a reserve wider than 13,5 meters, or where no reserve exists where the road is wider than 8 metres;

but excluding a road;

(a) which is identified and included in activity 27 in Listing Notice 2 of 2014; or

(b) where the entire road falls within an urban area; or

(c) which is 1 kilometre or shorter

The proposed development will comprise of the construction of access roads to erven where no road reserve exists.

Activity No. 27:

The clearance of an area of 1 hectares or more, but less than 20 hectares of indigenous vegetation, except where such clearance of indigenous vegetation is required for;

(i) the undertaking of a linear activity; or
(ii) maintenance purposes undertaken in accordance with a maintenance management plan.

The proposed development will result in the clearance of an area of approximately 15.59ha of disturbed indigenous vegetation within the Bushmanland Arid Grassland (LT) and the Lower Gariep Alluvial (EN) Ecosystem Types.

Activity No. 56: *The widening of a road by more than 6 metres, or the lengthening of a road by more than 1 kilometre;*
(i) where the existing reserve is wider than 13,5 meters; or
(ii) where no reserve exists, where the existing road is wider than 8 metres;
excluding where widening or lengthening occur inside urban areas.

The proposed development will be comprised of lengthening existing roads present within the Gariep township, outside of an urban area.

Government Notice R325 (Listing notice 2)

N/A

Government Notice R324 (Listing Notice 3):

Activity No. 4: *The development of a road wider than 4 metres with a reserve less than 13.5 metres*

The proposed development will include the development of access roads wider than 4m in order for community members.

Activity No. 12: *The clearance of an area of 300 square metres or more of indigenous vegetation except where such clearance of vegetation is required for maintenance purposes undertaken in accordance with a maintenance management plan.*

The proposed development will involve the clearance of more than 300m^2 of indigenous vegetation within a Critical Biodiversity Area (CBA). Therefore, the proposed clearance of indigenous vegetation within a Biodiversity Spatial Plan triggers environmental authorisation through a Basic Assessment process

Activity No. 14: *The development of;*
(i) dams or weirs, where the dam or weir, including infrastructure and water surface area, exceeds 10 square metres;
(ii) infrastructure or structures with a physical footprint of 10 square metres or more;

where such development occurs;
(a) within a watercourse;
(b) in front of a development setback; or
(c) if no development setback exists, within 32 metres of a watercourse, measured from the edge of a watercourse;

Excluding the development of infrastructure or structures within existing ports or harbours that will not increase the development footprint of the port or harbour;

Services (Refer to Appendix D5):
The services required (as per the Engineering Services Investigation Report (Appendix D5)) by the proposed development include:

- **Site access:** access to the proposed development will be via existing Residential Collector Streets (Class 4b).

- **Electricity supply**: the upgrade and extension of the existing bulk electrical supply system is required by Eskom. The Gariep community falls within the Eskom Distribution where the existing electrified households purchase electricity from Eskom and not he Municipality. It must be noted that although the existing feeder will be able to service the proposed development, the 162kVA load can only be serviced once the Groblershoop substation has been upgraded and brought online by Eskom's Network Planning Department.

- **Water supply**: the proposed development will approximately double the demand for water and thus the upgrading of the entire bulk water supply is required. Based on the current state of the Gariep bulk water infrastructure and calculated annual average daily demand (AADD), the following recommendations have been made:
    - Proposed construction of a new 12l/s mobile river pump station with a duty and standby pump;
    - New 125mm diameter Class 6 PVC pipeline between the river pump station and the existing potable water storage reservoir.
    - Upgraded Water Treatment Works capable of delivering 24m3/h on the existing treatment works site as well as a new 360m3 sectional steel reservoir next to the upgraded water treatment works. A new 24l/s uplifting pump station at the treatment works.
    - A new 250m^3 sectional steel pressure tower on the highest point to the north.
    - A new 200mm pipeline between the lifting pump station and the pressure tower.

- **Sewage:** all existing households within the Gariep Settlement are serviced by Ventilated Improved Pit (VIP) toilets as no bulk sewer infrastructure is present. The construction of a full-borne sewerage system is recommended. This will include the construction of;
    - 1 x 0.5ML Waste Water Treatment Works (WWTW);
    - 2 x 6.6l/s pump stations; and
    - 2 x 110mm rising mains (1.3km and 2.1km);

- **Waste management/removal (hazardous and domestic)**: Solid waste, generated during construction activities, will be consolidated, and disposed of by the local municipality. A solid waste management must be prepared for the post-construction phase.

- **Storm water management**: Gariep is a small settlement where stormwater drains from the centre of the site. According to the Engineering Services Investigation Report (Appendix D5), the guiding principle is that the peak stormwater runoff from the site, post construction, should not exceed the full range of storm return periods (1:2 to 1:50) of the site pre-construction. Stormwater infrastructure must be constructed to:
    - Accommodate minor storm events (i.e. 1:5 years) in open channels or side drains of streets;
    - Accommodate major storm events (i.e. 1:50 year) through controlled overland flows, aboveground attenuation storage, and berms at the higher end of the site; and
    - Infrastructure must be constructed to prevent pooling of stormwater runoff;

Environmental component:

The site is located within 32m of a watercourse. One NFEPA wetland, associated with the Orange River was identified, within 500m of the Gariep Housing site (Figure 11). The site is located within two Critical Biodiversity Areas (CBAs), namely CBA 1 (6 551m^2) and CBA 2 (~143 449m^2). A section (6 551m^2) of the proposed site for development is located within the Lower Gariep Alluvial Ecosystem Type (Endangered, EN) whereas the remainder of the site is located within the Bushmanland Arid Grassland (Least Threatened, LT).

As per the **Botanical Assessment (Appendix D1)**:

- Of the 15ha footprint, approximately 4.16ha are already disturbed or transformed (settled). The remainder of the site supported a very dry and reduced vegetation layer.
- Vegetation associated with the Site I includes natural veld in relative good condition whereas Sites II and III are disturbed / transformed with a very sparse vegetation layer (Figure 1).
- The most significant botanical aspect of this site is the presence of a four (4) protected Camel Thorn (*Vachellia erioloba*) trees and a number of protected Sheppard trees (*Boscia albitrunca*) and a number of Northern Cape Nature Conservation Act, protected species.
- According to the impact assessment, the development is likely to result in a **Medium - Low** impact, which can be reduced to a **Low** impact with good environmental control during construction.
- With the correct mitigation it is unlikely that the development will contribute significantly to any of the following:
  - Significant loss of vegetation type and associated habitat.
  - Loss of ecological processes (e.g. migration patterns, pollinators, river function etc.) due to construction and operational activities.
  - Loss of local biodiversity and threatened plant species.
  - Loss of ecosystem connectivity.

The botanical specialist recommended that, with the available information, the project be approved with the proposed mitigation actions.

As per the **Freshwater Assessment (Appendix D2)**:

- A drainage line is located adjacent to the eastern and southern boundary of the proposed site for development. A small section of this drainage line is located within the proposed site of development. The Present Ecological State (PES) of the drainage line was classified as Class D, characterized as largely modified with a significant loss of natural habitat, biodiversity, and ecosystem functioning. The Ecological Importance (EI) of the drainage line (in close proximity to the site) is based on the presence of threatened fish species. As the non-perennial drainage line was dry at the time of the site visit, the EI could not be measured. No endangered fauna or flora were present along the drainage line.
- The sub-catchment, associated with the proposed site for development, is 192ha in size, with a circumference of 5.8km and is a relatively small sub-catchment with a short drainage line, where a small section of the sub-catchment transects the boundary onto the new development. Another small sub-catchment is located approximately 150m north of the proposed site for development.
- The drainage lines are dry where during heavy rainfall events, flooding may occur.
- In conclusion, the specialist stated that the driver of the drainage lines is the occasional flood that follows sudden and intense rainfall events. This is followed by prolonged droughts and intense summer heat that prevents the development of any viable aquatic habitat. These drivers, along with shallow groundwater, has resulted in the growth of vegetation along the drainage line.
- As per the Assessment, sewage is a serious threat to the grape, other fruit and food export industry. The current sewage and solid waste situation are threats to the WULA. The authorities may insist that these issues be resolved before a General Authorization is approved.

As per the **Heritage Impact Assessment (Appendix D3)**:

- No significant heritage sites or features were identified within the surveyed sections of Plot 113, Boegoebergnedersetting RE/48, Gariep Settlement. The Early/Middle Stone Age cultural material identified is not conservation worthy. No further mitigation is recommended with regards to these resources. Therefore, from a heritage point of view, we recommend that the proposed development can continue;
- The Gariep cemeteries are situated well outside the development footprint. These sites are graded as IIIB and are of High Local Significance. No further mitigation is recommended

with regards to these resources. No other graves were identified on the development footprint.

- Due to the low palaeontological significance of the area, no further palaeontological heritage studies, ground-truthing and/or specialist mitigation are required. It is considered that the development of the proposed development is deemed appropriate and feasible and will not lead to detrimental impacts on the palaeontological resources of the area (Butler 2020).

As per the **Geotechnical Investigation (Appendix D4)**:
The Geotechnical Specialist concluded that the entire area is regarded as being of intermediate suitability for residential development as per the following site class designations:

Geotechnical Zone I: zone is classed as R (i.e. proposed horizon for founding is stable and negligible soil movement is expected) where this zone makes up 87% of the proposed area for development. The viable foundation alternative is founding by conventional strip foundations. The slope across the zone ranges from 2 – 6%.

Geotechnical Zone II: zone is classed as R (i.e. proposed horizon for founding is stable and negligible soil movement is expected) where this zone makes up 6% of the proposed area for development. Two foundation design alternatives are applicable to this zone, namely the conventional strip foundation or the slab-on-the-ground foundations (placed directly on bedrock or on very deep pedocrete). The slope across the zone is less than 2%.

Geotechnical Zone III: zone is classed as S (i.e. proposed horizon for founding is slightly compressible and rapid settlement less than 10mm is expected) where this zone makes up ~2.5% of the proposed area for development. Two foundation design alternatives are applicable to this zone, namely the conventional strip foundation or the slab-on-the-ground foundations (placed directly on medium dense terrace gravels. The slope across the zone ranges from 2 – 6%.

Geotechnical Zone IV: zone is classed as S (i.e. proposed horizon for founding is slightly compressible and rapid settlement less than 10mm is expected) where this zone makes up 4% of the proposed area for development. Two foundation design alternatives are applicable to this zone, namely the conventional strip foundation or the slab-on-the-ground foundations (placed directly on medium dense terrace gravels. The slope across the zone is less than 2%.

Geohydrological description as per the Geotechnical Investigation (Appendix D4):
Perched water was not encountered during the geotechnical site investigation. The Geotechnical specialist concluded that perched water is not anticipated to be problematic on the site. Groundwater is expected to occur at depths less than 15m in compact, argillaceous strata. Probability of drilling for water in the area ranges from 40 – 60% where the probability of finding a borehole which produces more than 2l/s ranges between 10 – 20%. The non-perennial watercourses may be regarded as being of lesser importance and do not require any additional precautionary measures to ensure safety of the population against flooding.

b) Provide a detailed description of the listed activities associated with the project as applied for

Listed activity as described in GN 327, 325 and 324, EIA Regulations (2014 as amended)	Description of project activity
GN 327 Listing Notice 1	
Activity 9: The development of infrastructure exceeding 1000 metres in length for the bulk transportation of water or storm water; (i) with an internal diameter of 0,36 metres or more; or (ii) with a peak throughput of 120 litres per second or more; excluding where; a) such infrastructure is for bulk transportation of water or storm water or storm water drainage inside a road reserve or railway line reserve; or b) where such development will occur within an urban area.	The proposed development will result in the construction of infrastructure exceeding 1000m with a peak throughput of more than 120l/s.
Activity 10: The development and related operation of infrastructure exceeding 1000 metres in length for the bulk transportation of sewage, effluent, process water, waste water, return water, industrial discharge or slimes (i) with an internal diameter of 0,36 metres or more; or (ii) with a peak throughput of 120 litres per second or more; excluding where; (a) such infrastructure is for the bulk transportation of sewage, effluent, process water, waste water, return water, industrial discharge or slimes inside a road reserve or railway line reserve; or (b) where such development will occur within an urban area.	The proposed development includes the construction of infrastructure (i.e. rising mains) with an approximate total length of 3.3km.with a peak flow greater than 120 l/s.
Activity 12: The development of; (i) dams or weirs, where the dam or weir, including infrastructure and water surface area, exceeds 100 square metres; (ii) infrastructure or structures with a physical footprint of 100 square metres or more; where such development occurs; (a) within a watercourse; (b) in front of a development setback; or (c) if no development setback exists, within 32 metres of a watercourse,	The proposed development includes the development of new infrastructure which will exceed 100m^2 and is located less than 32m from a watercourse. Therefore, the construction of more than 100m^2 of infrastructure triggers environmental authorisation through a Basic Assessment process.

measured from the edge of a watercourse;	
Activity 19: The infilling or depositing of any material of more than 10 cubic metres into, or the dredging, excavation, removal or moving of soil, sand, shells, shell grit, pebbles or rock of more than 10 cubic metres from a watercourse; (a) will occur behind a development setback; (b) is for maintenance purposes undertaken in accordance with a maintenance management plan; or (c) falls within the ambit of activity 21 in this Notice, in which case that activity applies.	The proposed development is located adjacent to an existing watercourse (ephemeral stream). During construction there is a probability that the watercourse may be impacted upon. Therefore, the infilling/ excavation of more than $10m^3$ within a watercourse triggers environmental authorisation through a Basic Assessment process.
Activity 24: The development of a road; (i) for which an environmental authorisation was obtained for the route determination in terms of activity 5 in Government Notice 387 of 2006 or activity 18 in Government Notice 545 of 2010; or (ii) with a reserve wider than 13,5 meters, or where no reserve exists where the road is wider than 8 metres; but excluding a road; (a) which is identified and included in activity 27 in Listing Notice 2 of 2014; or (b) where the entire road falls within an urban area; or (c) which is 1 kilometre or shorter	The proposed development will comprise of the construction of access roads to erven where no road reserve exists.
Activity 27: The clearance of an area of 1 ha or more, but less than 20 ha of indigenous vegetation.	The proposed development will result in the clearance of an area of approximately 15.59ha of disturbed indigenous vegetation within the Bushmanland Arid Grassland (LT) and the Lower Gariep Alluvial (EN) Ecosystem Types. Therefore, the proposed clearance of more than 1ha but less than 20ha of indigenous vegetation triggers environmental authorisation through a Basic Assessment process.
Activity 56: The widening of a road by more than 6 metres, or the lengthening of a road by more than 1 kilometre; (i) where the existing reserve is wider than 13,5 meters; or (ii) where no reserve exists, where the existing road is wider than 8 metres; excluding where widening or lengthening occur inside urban areas.	The proposed development will be comprised of lengthening existing roads present within the Gariep township. Therefore, the proposed lengthening of existing roads triggers environmental authorisation through Basic Assessment process.
GN 325 Listing Notice 2	
N/A	

GN 324 Listing Notice 3	
Activity 4: The development of a road wider than 4 metres with a reserve less than 13.5 metres.	The proposed development will include the development of access roads wider than 4m in order for community members. Therefore, the proposed construction of roads wider than 4m triggers environmental authorisation through the Basic Assessment process.
Activity 12: The clearance of an area of 300 square metres or more of indigenous vegetation except where such clearance of vegetation is required for maintenance purposes undertaken in accordance with a maintenance management plan.	The proposed development will involve the clearance of more than 300m^2 of indigenous vegetation within the Lower Gariep Alluvial, an Endangered (EN) ecosystem type. Therefore, the proposed clearance (approximately 6551m^2) of indigenous vegetation within an endangered ecosystem type triggers environmental authorisation through a Basic Assessment process.
Activity 14: The development of— (i) dams or weirs, where the dam or weir, including infrastructure and water surface area exceeds 10 square metres; or (ii)infrastructure or structures with a physical footprint of 10 square metres or more; where such development occurs— (a) within a watercourse; (b) in front of a development setback; or (c) if no development setback has been adopted, within 32 metres of a watercourse, measured from the edge of a watercourse; (g) Northern Cape ii. Outside urban areas: (aa) A protected area identified in terms of NEMPAA, excluding conservancies; (ff) Critical biodiversity areas or ecosystem service areas as identified in systematic biodiversity plans adopted by the competent authority or in bioregional plans;	More than 10m^2 of infrastructure will be constructed within 32m of a watercourse within a Critical Biodiversity Area and within an endangered ecosystem type (lower Gariep Alluvial), therefore triggering this activity.

2) FEASIBLE AND REASONABLE ALTERNATIVES

"alternatives", in relation to a proposed activity, means different means of meeting the general purpose and requirements of the activity, which may include alternatives to—

(a) the property on which or location where it is proposed to undertake the activity;
(b) the type of activity to be undertaken;
(c) the design or layout of the activity;
(d) the technology to be used in the activity;
(e) the operational aspects of the activity; and
(f) the option of not implementing the activity.

Describe alternatives that are considered in this application as required by Appendix 1 (3)(h), Regulation 2014. Alternatives should include a consideration of all possible means by which the purpose and need of the proposed activity (NOT PROJECT) could be accomplished in the specific instance taking account of the interest of the applicant in the activity. The no-go alternative must in all cases be included in the assessment phase as the baseline against which the impacts of the other alternatives are assessed.

The determination of whether site or activity (including different processes, etc.) or both is appropriate needs to be informed by the specific circumstances of the activity and its environment. After receipt of this report the, competent authority may also request the applicant to assess additional alternatives that could possibly accomplish the purpose and need of the proposed activity if it is clear that realistic alternatives have not been considered to a reasonable extent.

Indicate the position of the activity using the latitude and longitude of the centre point of the site for each alternative site. The co-ordinates should be in degrees, minutes and seconds. The projection that must be used in all cases is the WGS84 spheroid in a national or local projection.

PURPOSE AND NEED OF THE PROPOSED ACTIVITY

The !Kheis Local Municipality's aims to promote socioeconomic development through the eradication of backlogs associated with water and sanitation, electricity, and housing, as well as improve basic services within Gariep. In order to meet the needs of the community within Gariep, the Council[1] resolved that a project business plan be submitted to Co-operative Governance, Human Settlements and Traditional Affairs (COGHSTA) as well as the construction of 135 houses in Gariep over the short to medium term. As per the !Kheis Integrated Development Plan (IDP) 2019/2020, a key performance indicator includes the provision of infrastructure and basic service through securing suitable land for human settlement projects. Suitable land was previously identified in Topline, Wegdraai, Grootdrink, Gariep, Opwag, and Boegoeberg. The provision of affordable housing units remains a high priority for the Municipality which will restore the dignity of poor people by providing shelter and access to basic human rights as enshrined in the Constitution of South Africa.

The proposed Gariep Housing development is in line with the !Kheis IDPs key strategic and development objectives, namely to improve and maintain basic service delivery through specific infrastructural projects including human settlements and basic services, in the poverty-stricken Gariep Township . As of 2011, the demographic profile of the KLM includes the total population of 16 637 individuals with a total number of 4 145 households. According to the SDF, Gariep had a population of 1558 in 2001, 2189 in 2011 and a projected population of 2073 in 2020. The exponential change rate between 2001 and 2011 was 0,01571. The change rate between 2011 and 2020 is expected to be 11.6%. The houses required by 2020 are estimated to be 532 according to the SDF. Therefore, this community requires formalized, state-instituted housing, and associated, infrastructure. The proposed development will distribute the density of the population, improve community member's standard of living, as well as access to essential services including roads, electricity, water supply, appropriate sewage disposal infrastructure, and environmental health in the area. Therefore, the proposed development will enable adequate housing to be constructed, thereby promoting access to basic service delivery as well as socioeconomic development in the Gariep Township and its surroundings.

[1] A Project Steering Committee (PSC) will be established for the human settlements project. The PSC will draft a list of criteria to be used in the selection process of employing local labourers. This list will be included in the contract documentation as a guideline for the appointed contractor on his employment policy. Aspects which will receive special consideration in the list of criteria are gender equality, unemployed residents, single headed households, youth and women employment.

As per the Needs and Desirability Report (Appendix D6), the study area will be able to accommodate the planned 135 erven that forms part of this project. We have calculated that approximately 40 families reside on the property presently and are thus in dire need for formalisation. It is clear from the number of existing informal houses erected on the property, that this study area is indeed habitable and that there is an urgent need for residential erven within the sub-economic market.

!Kheis Local Municipality is committed to the vision of the National Government of which it committed itself towards accelerating shared growth to halve poverty and unemployment and promote social inclusions. Housing is one of the social inclusions in this vision. !Kheis Local Municipality does however not have enough funding available to their disposal to finance this size project.

SITE ALTERNATIVE

No feasible alternative sites were considered due to:

1. **Location of the proposed site**: the proposed site for development is located adjacent to the existing Gariep township and thus, the existing land use is in line with the proposed activities of the development. The area surrounding the existing township is highly disturbed due to illegal dumping as well as tree harvesting for firewood.
2. **Proximity to watercourses**: as identified by the Freshwater Specialist, a watercourse of importance is located adjacent to the eastern boundary of the proposed development footprint. Moreover, a drainage line is located ~200m south and the Orange River is located ~480m west of the proposed site for development. It must be noted that the irrigation canal is located ~20m north west and west of the site boundary.
3. **Use of existing services**: the construction of the proposed development surrounding the existing Gariep township will enable construction activities to utilize existing services (namely existing roads) to access the site. This will reduce the need to construct new access roads and therefore, the unnecessary clearance of vegetation. The proposed site is located adjacent to the existing residential area of Gariep. As stated above, this would provide accessibility and allow the proposed development to link to the existing services infrastructure.
4. **Previously earmarked for development**: the proposed site for development was previously earmarked as suitable land for housing development (as stipulated in the !Kheis Local Municipality Land Development Plan/ Rural Spatial Development Framework, 2014).
5. **Ownership**: No other site alternatives were considered. The site is owned by the Applicant, and within the urban edge, and is therefore considered the only reasonable and feasible site

The preferred alternative takes into account the findings of the specialist reports, namely Botanical Assessment (Appendix D1), Freshwater Assessment (Appendix D2), Heritage Impact Assessment (Appendix D3), and Geotechnical Investigation (**Appendix D4**). The preferred alternative development footprint is located further from the non-perineal watercourse located on a slight decline going towards the watercourse.

a) Site alternatives

No other site alternatives were considered. The site is owned by the Applicant, within the urban edge, and will tie in with existing services and is therefore considered the only reasonable and feasible site.

See **Figure 1** for location of GPS co-ordinates.

Alternative 3 (preferred alternative)		
Description	**Lat (DDMMSS)**	**Long (DDMMSS)**
Corner 1	28°36'48.23"S	21°46'40.07"E
Corner 2	28°36'47.58"S	21°46'41.44"E
Corner 3	28°36'53.69"S;	21°46'44.89"E
Corner 4	28°36'51.64"S	21°46'49.05"E
Corner 5	28°36'49.99"S	21°46'48.04"E
Corner 6	28°36'50.16"S	21°46'49.84"E
Corner 7	28°36'54.41"S	21°46'49.34"E
Corner 8	28°36'55.82"S	21°46'50.12"E

Corner 9	28°36'58.19"S	21°46'44.84"E
Corner 10	28°36'56.98"S	21°46'43.12"E
Corner 11	28°36'55.02"S	21°46'42.57"E
Corner 12	28°36'52.46"S	21°46'42.98"E
Corner 13	28°36'51.43"S	21°46'42.89"E
Corner 14	28°36'50.62"S	21°46'42.41"E
Corner 15	28°36'50.62"S	21°46'42.41"E
Corner 16	28°36'54.46"S	21°46'51.19"E
Corner 17	28°36'49.29"S	21°47'3.14"E
Corner 18	28°36'47.30"S	21°47'2.00"E
Corner 19	28°36'45.07"S	21°46'58.57"E
Corner 20	28°36'43.55"S	21°47'3.37"E
Corner 21	28°36'38.75"S	21°47'1.45"E
Corner 22	28°36'37.34"S	21°47'5.55"E
Corner 23	28°36'41.13"S	21°47'6.40"E
Corner 24	28°36'48.97"S	21°47'6.01"E
Corner 25	28°36'55.19"S	21°46'51.56"E
Corner 26	28°36'55.10"S	21°46'51.35"E
Corner 27	28°36'54.70"S	21°46'51.13"E
Corner 28	28°36'44.47"S	21°46'45.41"E
Corner 29	28°36'40.71"S	21°46'43.13"E
Corner 30	28°36'39.04"S	21°46'44.85"E
Corner 31	28°36'37.59"S	21°46'44.06"E
Corner 32	28°36'34.42"S	21°46'55.86"E
Corner 33	28°36'34.62"S	21°47'2.71"E
Corner 34	28°36'36.11"S	21°47'2.93"E
Corner 35	28°36'35.74"S	21°47'5.01"E
Corner 36	28°36'36.76"S	21°47'5.36"E
Corner 37	28°36'39.90"S	21°46'56.42"E
Corner 38	28°36'39.37"S	21°46'56.10"E
Corner 39	28°36'40.89"S	21°46'52.90"E
Corner 40	28°36'40.69"S	21°46'52.96"E
Corner 41	28°36'39.16"S	21°46'52.01"E
Corner 42	28°36'39.12"S	21°46'51.79"E
Corner 43	28°36'41.89"S	21°46'46.00"E
Corner 44	28°36'42.14"S	21°46'45.95"E
Corner 45	28°36'43.63"S	21°46'46.83"E
Corner 46	28°36'43.68"S	21°46'47.12"E
Alternative 2		
Description	Lat (DDMMSS)	Long (DDMMSS)
Corner 1 (N):		
Corner 2 (E):		
Corner 3 (S):		
Corner 4 (W):		
Alternative 3		
Description	Lat (DDMMSS)	Long (DDMMSS)

In the case of linear activities:

Alternative 1 (preferred alternative)		
Description	Lat (DDMMSS)	Long (DDMMSS)
N/A		
Alternative 2		
Description	Lat (DDMMSS)	Long (DDMMSS)

N/A		
Alternative 3		
Description	Lat (DDMMSS)	Long (DDMMSS)
N/A		

For route alternatives that are longer than 500m, please provide an addendum with co-ordinates taken every 250 meters along the route for each alternative alignment.

In the case of an area being under application, please provide the co-ordinates of the corners of the site as indicated on the lay-out map provided in Appendix A of this form.

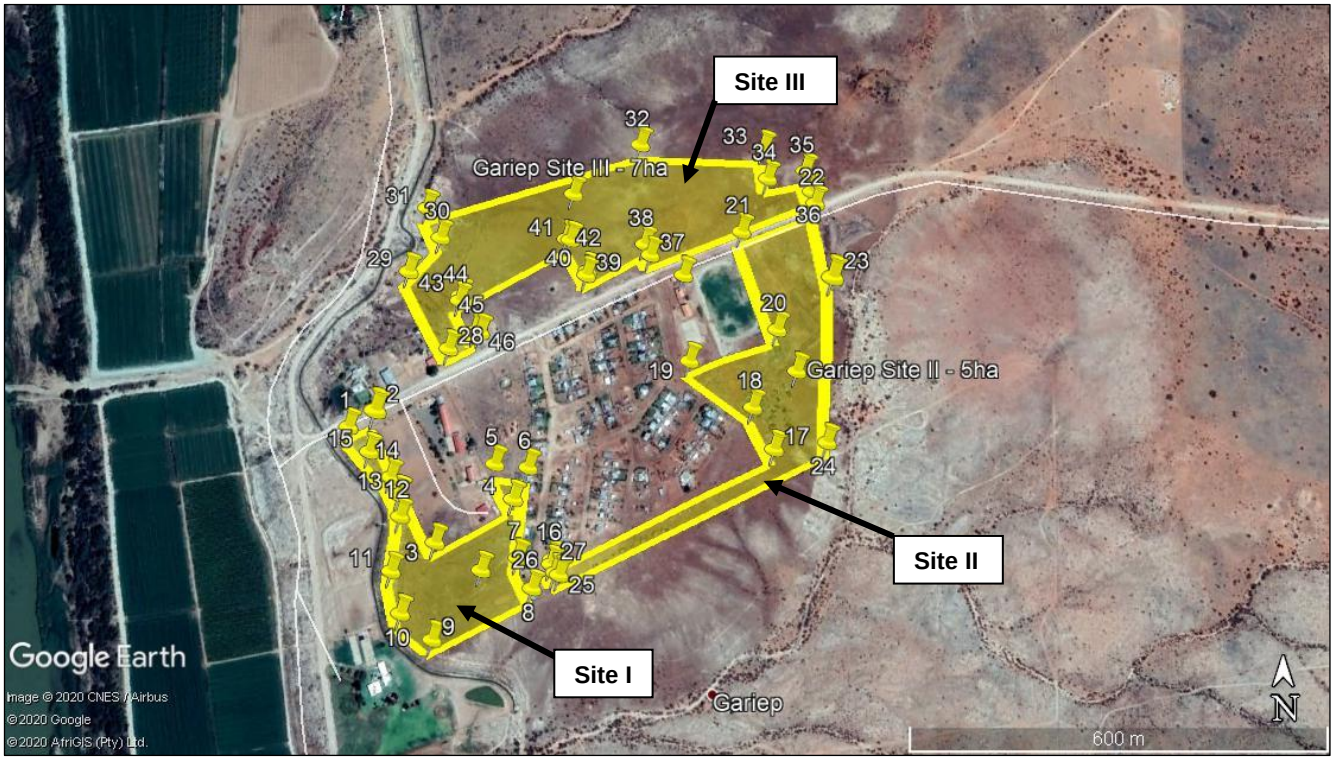

Figure 1. GPS co-ordinates of the proposed Gariep site.

b) Lay-out alternatives

Alternative 1		
Description	Lat (DDMMSS)	Long (DDMMSS)
Alternative 1 (Appendix C) is the first of three (3) concept layouts initially proposed. The layout included 135 erven with an extent of approximately 15ha, which included; - Residential Zone I – 135 land units (namely sub-economic households) is proposed;	No other site alternatives were considered. Please refer to preferred alternative site location GPS co-ordinates.	

- Undetermined Zone – one (1) land unit; - Open Space Zone I – one (1) land unit; This alternative was considered a viable option as it provides an adequate number of housing opportunities as per the Needs and Desirability Report (Appendix D6). No erven have been considered in the northern section of the proposed development. Stormwater run-off can be channelled by the proposed road networks. The road network comprises of narrow roads, due to the existing position of residential structures. Moreover, due to existing services and infrastructure, as well as identified environmental sensitive areas, this layout needed to be amendment (see Alternative below).		
Alternative 2		
Description	Lat (DDMMSS)	Long (DDMMSS)
Alternative 2 (Appendix C) is the second of three (3) concept layouts initially proposed. The layout included 135 erven with an extent of approximately 15ha, which includes; • Residential Zone I – 135 land units (namely sub-economic households) is proposed; • Open Space Zone II – two (2) land units; and • Business Zone IV – one (1) unit. This alternative was considered a viable option as it provides an adequate number of housing opportunities as per the Needs and Desirability Report (Appendix D6). No erven have been considered in the northern section of the proposed development. Stormwater run-off can be channelled by the proposed road networks. The road network comprises of narrow roads, due to the existing position of residential structures. Moreover, due to existing services and infrastructure, as well as identified environmental sensitive areas, this layout needed to be amendment (see Alternative below).	No other site alternatives were considered. Please refer to preferred alternative site location GPS co-ordinates.	
Alternative 3 (preferred alternative)		
Description	Lat (DDMMSS)	Long (DDMMSS)
Alternative 3 (Appendix C) was the final layout proposed and is the Applicant's Preferred Layout. This layout includes 135 erven, over approximately 15ha extent and includes; • Residential Zone I – 135 land units (namely sub-economic households) is proposed. Primary Use: Dwelling House; • Open Space Zone II – eight (8) land units. Where open space refers to land set aside or to be set aside for the use by a community as a recreation area; • Institutional Zone II – two (2) land units; • Authority Zone II – two (2) land units which will be established in accordance with the requirements of the Guidelines for Human Settlement Planning and Design; • Business Zone 1 – three (3) land unit. Primary Use: Hotels, guest houses, places of refreshment, shops, business premises, dwelling units, residential building, place of amusement, places of worship including funeral parlours with chapels, places of instruction, dry cleaners, public garages, parking, car wash, social halls. This alternative was considered a viable option as it provides an adequate number of housing opportunities as per the Needs	No other site alternatives were considered. Please refer to preferred alternative site location GPS co-ordinates.	

and Desirability Report (Appendix D6). No erven have been considered in the eastern section of the proposed development (i.e. in proximity to the drainage line). Stormwater run-off can be channelled by the proposed road networks. The road network comprises of narrow roads, due to the existing position of residential structures. This layout has incorporated environmentally sensitive areas as well as future access to services. Therefore, this layout was the preferred layout.	

c) Technology alternatives

No technology alternatives were considered. This is a housing development, and therefore, there are no technology alternatives.

Alternative 1 (preferred alternative)
Alternative 2
Alternative 3
Alternative 4

d) Other alternatives (e.g. scheduling, demand, input, scale and design alternatives)

NA

Alternative 1 (preferred alternative)		
N/A		
Alternative 2		
N/A		
Alternative 3		
N/A		

e) No-go alternative

This would mean that no-development would take place and the proposed site will remain as is. No new, negative environmental impact(s) will take place however, current illegal dumping of general and hazardous waste will continue to take place. As no bulk sewer infrastructure is present, the community will continue using Ventilated Improved Pit (VIP) toilets which may result in the contamination of the receiving environment. The no-go alternative will impede socioeconomic development in the area as no short- and long-term employment and skills-development opportunities will be created relative to this proposed development. As per the Botanical Assessment, the No-Go option is not likely to result in a “no-impact” scenario, as constant slow degradation is expected to continue as a result of urban activities and poor management of the site.

Paragraphs 3 – 13 below should be completed for each alternative.

3) PHYSICAL SIZE OF THE ACTIVITY

a) Indicate the physical size of the preferred activity/technology as well as alternative activities/technologies (footprints):

Alternative:	**Size of the activity:**
Alternative A1 (preferred activity alternative)	**150 000m²**
Alternative A2 (if any)	Same as above
Alternative A3 (if any)	Same as above

or, for **linear activities**: N/A

	Length of the activity:
Alternative A1 (preferred activity alternative)	

Alternative A1 (preferred activity alternative)	
Alternative A2 (if any)	
Alternative A3 (if any)	
Alternative A4 (if any)	

b) Indicate the size of the alternative sites or servitudes (within which the above footprints will occur):

	Length of the activity:
Alternative A1 (preferred activity alternative)	m²

	150 000m²
Alternative A1 (if any)	Same as above
Alternative A2 (if any)	Same as above
Alternative A3 (preferred activity alternative)	
Alternative A4 (if any)	

4) SITE ACCESS

	YES	~~**NO**~~
Does ready access to the site exist?		
If NO, what is the distance over which a new access road will be built		

Describe the type of access road planned:

Access to the proposed development would be via existing Residential Collector Streets (Class 4b).

Include the position of the access road on the site plan and required map, as well as an indication of the road in relation to the site.

5) LOCALITY MAP

An A3 locality map must be attached to the back of this document, as Appendix A. The scale of the locality map must be relevant to the size of the development (at least 1:50 000. For linear activities of more than 25 kilometres, a smaller scale e.g. 1:250 000 can be used. The scale must be indicated on the map.). The map must indicate the following:

- an accurate indication of the project site position as well as the positions of the alternative sites, if any;
- indication of all the alternatives identified;

- closest town(s;)
- road access from all major roads in the area;
- road names or numbers of all major roads as well as the roads that provide access to the site(s);
- all roads within a 1km radius of the site or alternative sites; and
- a north arrow;
- a legend; and
- locality GPS co-ordinates (Indicate the position of the activity using the latitude and longitude of the centre point of the site for each alternative site. The co-ordinates should be in degrees and decimal minutes. The minutes should have at least three decimals to ensure adequate accuracy. The projection that must be used in all cases is the WGS84 spheroid in a national or local projection).

6) LAYOUT/ROUTE PLAN

A detailed site or route plan(s) must be prepared for each alternative site or alternative activity. It must be attached as Appendix A to this document.

The site or route plans must indicate the following:

- the property boundaries and numbers of all the properties within 50 metres of the site;
- the current land use as well as the land use zoning of the site;
- the current land use as well as the land use zoning each of the properties adjoining the site or sites;
- the exact position of each listed activity applied for (including alternatives);
- servitude(s) indicating the purpose of the servitude;
- a legend; and
- a north arrow.

7) SENSITIVITY MAP

The layout/route plan as indicated above must be overlain with a sensitivity map that indicates all the sensitive areas associated with the site, including, but not limited to:

- watercourses;
- the 1:100 year flood line (where available or where it is required by DWS);
- ridges;
- cultural and historical features;
- areas with indigenous vegetation (even if it is degraded or infested with alien species); and
- critical biodiversity areas.

The sensitivity map must also cover areas within 100m of the site and must be attached in Appendix A.

8) SITE PHOTOGRAPHS

Colour photographs from the centre of the site must be taken in at least the eight major compass directions with a description of each photograph. Photographs must be attached under Appendix B to this report**.** It must be supplemented with additional photographs of relevant features on the site, if applicable.

9) FACILITY ILLUSTRATION

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

10) ACTIVITY MOTIVATION

Motivate and explain the need and desirability of the activity (including demand for the activity):

• **Is the activity permitted in terms of the property's existing land use rights?**	~~YES~~	**NO**	Please explain
The site is zoned as Agricultural Zone I. A Spatial Planning Land Use Application ("SPLUMA") application will be submitted for the rezoning and subdivision of land use change. This involves the rezoning to various land uses, namely Residential Zone I, Open Space Zone II, Business Zone I, Institutional Zone II, and Authority Zone II. The total area to be developed measures approximately fifteen (15) hectares.			
• **Will the activity be in line with the following?**			
(a) Provincial Spatial Development Framework (PSDF)	**YES**	~~NO~~	Please explain
The Northern Cape Provincial Spatial Development Framework/ Development & Resource Management Plan was completed in 2012 and reviewed in 2018[2]. Spatial development strategies, as highlighted in section 6.1.3. of the PSDF, include the eradication of backlogs in water and sanitation, electricity, and housing, as well as improve basic services. Moreover, the PSDF aims to improve the quality of subsidized housing settlements within the Province. These strategic development strategies are in line with the Global Sustainable Development guidelines to ensure that the needs of the current generation are met without exploiting resources which will be required by future generations. Therefore, as the proposed development includes the construction of houses and associated basic service infrastructure, this project is in line with the PSDF.			
(b) Urban edge / Edge of Built environment for the area	**YES**	~~NO~~	Please explain
The site is located within the urban edge of the Gariep Settlement.			
(c) Integrated Development Plan (IDP) and Spatial Development Framework (SDF) of the Local Municipality (e.g. would the approval of this application compromise the integrity of the existing approved and credible municipal IDP and SDF?).	**YES**	~~NO~~	Please explain
The !Kheis Local Municipality's aims to promote socioeconomic development through the eradication of backlogs associated with water and sanitation, electricity, and housing, as well as improve basic services within Gariep. In order to meet the needs of the community within Gariep, the Council[3] resolved that a project business plan be submitted to Co-operative Governance, Human Settlements and Traditional Affairs (COGHSTA) as well as the construction of 135 sub-economic households in Gariep over the short to medium term. As per the !Kheis Integrated Development Plan (IDP) 2019/2020, a key performance indicator includes the provision of infrastructure and basic service through securing suitable land for human settlement projects. Suitable land was previously identified in Topline, Wegdraai, Grootdrink, Gariep, Opwag, and			

[2] Northern Cape – Reviewed PSDF Executive Summary 2018. Accessed at: http://app.spisys.gov.za/download.php?201809271245138HLWTRHI3MO3ECI2CM26

[3] A Project Steering Committee (PSC) will be established for the human settlements project. The PSC will draft a list of criteria to be used in the selection process of employing local labourers. This list will be included in the contract documentation as a guideline for the appointed contractor on his employment policy. Aspects which will receive special consideration in the list of criteria are gender equality, unemployed residents, single headed households, youth and women employment.

Boegoeberg. The provision of affordable housing units remains a high priority for the Municipality which will restore the dignity of poor people by providing shelter and access to basic human rights as enshrined in the Constitution of South Africa. The proposed Gariep Housing development is in line with the !Kheis IDPs key strategic and development objectives, namely to improve and maintain basic service delivery through specific infrastructural projects including human settlements and basic services, in the poverty-stricken Gariep Township .

As per the Needs and Desirability Assessment (Appendix D6), the existing Gariep Settlement and proposed site was earmarked for development in the SDF of 2016 (see Figure 2 below) which is in line with the !Kheis IDP. Approximately 40 families currently reside on the property where informal housing requires dire formalization. The numerous families currently living in the proposed area indicates that the area earmarked for development is habitable.

Figure 2. Proposed area associated with the existing Gariep Settlement which was previously earmarked for development. Source: Gariep Needs and Desirability Report, August 2020.

As of 2011, the demographic profile of the KLM includes the total population of 16 637 individuals with a total number of 4 145 households. According to the SDF, Gariep had a population of 1558 in 2001, 2189 in 2011 and a projected population of 2073 in 2020. The exponential change rate between 2001 and 2011 was 0,01571. The change rate between 2011 and 2020 is expected to be 11.6%. The houses required by 2020 are estimated to be 532 according to the SDF. Therefore, this community requires formalized, state-instituted housing, and associated, infrastructure. The proposed development will distribute the density of the population, improve community member's standard of living, as well as access to essential services including roads, electricity, water supply, appropriate sewage disposal infrastructure, and environmental health in the area. Therefore, the proposed development will enable adequate housing to be constructed, thereby promoting access to basic service delivery as well as socioeconomic development in the Gariep Township and its surroundings. !Kheis Local Municipality is committed to the vision of the National Government of which it committed itself towards accelerating shared growth to halve poverty and unemployment and promote social inclusions. Housing is one of the social inclusions in this vision. !Kheis Local

Municipality does however not have enough funding available to their disposal to finance this size project.			
(d) Approved Structure Plan of the Municipality	**YES**	~~NO~~	Please explain
Unknown.			
(e) An Environmental Management Framework (EMF) adopted by the Department (e.g. Would the approval of this application compromise the integrity of the existing environmental management priorities for the area and if so, can it be justified in terms of sustainability considerations?)	~~YES~~	**NO**	Please explain
No EMF was identified. However, the approval of the project will result in the transformation of approximately 15ha of land located within a CBA.			
(f) Any other Plans (e.g. Guide Plan)	~~YES~~	**NO**	Please explain
N/A			
• **Is the land use (associated with the activity being applied for) considered within the timeframe intended by the existing approved SDF agreed to by the relevant environmental authority (i.e. is the proposed development in line with the projects and programmes identified as priorities within the credible IDP)?**	**YES**	~~NO~~	Please explain
The !Kheis Local Municipality's aims to promote socioeconomic development through the eradication of backlogs associated with water and sanitation, electricity, and housing, as well as improve basic services within Gariep. In order to meet the needs of the community within Gariep, the Council[4] resolved that a project business plan be submitted to Co-operative Governance, Human Settlements and Traditional Affairs (COGHSTA) as well as the construction of 135 houses in Gariep over the short to medium term. As per the !Kheis Integrated Development Plan (IDP) 2019/2020, a key performance indicator includes the provision of infrastructure and basic service through securing suitable land for human settlement projects. Suitable land was previously identified in Topline, Wegdraai, Grootdrink, Gariep, Opwag, and Boegoeberg. The provision of affordable housing units remains a high priority for the Municipality which will restore the dignity of poor people by providing shelter and access to basic human rights as enshrined in the Constitution of South Africa. The proposed Gariep Housing development is in line with the !Kheis IDPs key strategic and development objectives, namely to improve and maintain basic service delivery through specific infrastructural projects including human settlements and basic services, in the poverty-stricken Gariep Township . As of 2011, the demographic profile of the KLM includes the total population of 16 637 individuals with a total number of 4 145 households. According to the SDF, Gariep had a population of 1558 in 2001, 2189 in 2011 and a projected population of 2073 in 2020. The exponential change rate between 2001 and 2011 was 0,01571. The change rate between 2011 and 2020 is expected to be 11.6%. The houses required by 2020 are estimated to be 532 according to the SDF. Therefore, this community requires formalized, state-instituted housing, and associated, infrastructure. The proposed development will distribute the density of the population, improve community member's standard of living, as well as access to essential services including roads, electricity, water supply, appropriate sewage disposal infrastructure, and environmental health in the area. Therefore, the proposed development will enable adequate housing to be constructed,			

[4] A Project Steering Committee (PSC) will be established for the human settlements project. The PSC will draft a list of criteria to be used in the selection process of employing local labourers. This list will be included in the contract documentation as a guideline for the appointed contractor on his employment policy. Aspects which will receive special consideration in the list of criteria are gender equality, unemployed residents, single headed households, youth, and women employment.

thereby promoting access to basic service delivery as well as socioeconomic development in the Gariep Township and its surroundings. !Kheis Local Municipality is committed to the vision of the National Government of which it committed itself towards accelerating shared growth to halve poverty and unemployment and promote social inclusions. Housing is one of the social inclusions in this vision. !Kheis Local Municipality does however not have enough funding available to their disposal to finance this size project.			
• **Does the community/area need the activity and the associated land use concerned (is it a societal priority)? (This refers to the strategic as well as local level (e.g. development is a national priority, but within a specific local context it could be inappropriate.)**	**YES**	~~NO~~	Please explain
The !Kheis Local Municipality's aims to promote socioeconomic development through the eradication of backlogs associated with water and sanitation, electricity, and housing, as well as improve basic services within Gariep. In order to meet the needs of the community within Gariep, the Council resolved that a project business plan be submitted to Co-operative Governance, Human Settlements and Traditional Affairs (COGHSTA) as well as the construction of 135 houses in Gariep over the short to medium term. As per the !Kheis Integrated Development Plan (IDP) 2019/2020, a key performance indicator includes the provision of infrastructure and basic service through securing suitable land for human settlement projects. Suitable land was previously identified in Topline, Wegdraai, Grootdrink, Gariep, Opwag, and Boegoeberg. The provision of affordable housing units remains a high priority for the Municipality which will restore the dignity of poor people by providing shelter and access to basic human rights as enshrined in the Constitution of South Africa. The proposed Gariep Housing development is in line with the !Kheis IDPs key strategic and development objectives, namely to improve and maintain basic service delivery through specific infrastructural projects including human settlements and basic services, in the poverty-stricken Gariep Township . As of 2011, the demographic profile of the KLM includes the total population of 16 637 individuals with a total number of 4 145 households. According to the SDF, Gariep had a population of 1558 in 2001, 2189 in 2011 and a projected population of 2073 in 2020. The exponential change rate between 2001 and 2011 was 0,01571. The change rate between 2011 and 2020 is expected to be 11.6%. The houses required by 2020 are estimated to be 532 according to the SDF. Therefore, this community requires formalized, state-instituted housing, and associated, infrastructure. The proposed development will distribute the density of the population, improve community member's standard of living, as well as access to essential services including roads, electricity, water supply, appropriate sewage disposal infrastructure, and environmental health in the area. Therefore, the proposed development will enable adequate housing to be constructed, thereby promoting access to basic service delivery as well as socioeconomic development in the Gariep Township and its surroundings. !Kheis Local Municipality is committed to the vision of the National Government of which it committed itself towards accelerating shared growth to halve poverty and unemployment and promote social inclusions. Housing is one of the social inclusions in this vision. !Kheis Local Municipality does however not have enough funding available to their disposal to finance this size project. The Green Drop Program (DWS incentive regulation) promoting the effective and efficient management of wastewater. As per the Green Drop Report (2010/11), the 71 treatment facilities within the Northern Cape Province receive approximately 93mL/day. Although the total collective hydraulic design capacity of these treatment facilities are 150ML/day, the remaining 38.5% surplus capacity may not be readily available due to inadequate maintenance and operational deficiencies at lower capacity municipalities. For example, the current state of the Boegoeberg WWTW may not be amenable to service an increased amount of sewage generated by the expected number of community members who will be benefiting from the construction of the new housing. Moreover, the existing Gariep township does not have bulk sewer infrastructure and currently use Ventilated Improved Pit (VIP) toilets further comprises the effective and efficient management of wastewater. See section below regarding recommendations, as per the Engineering Services Report, on sewerage management.			

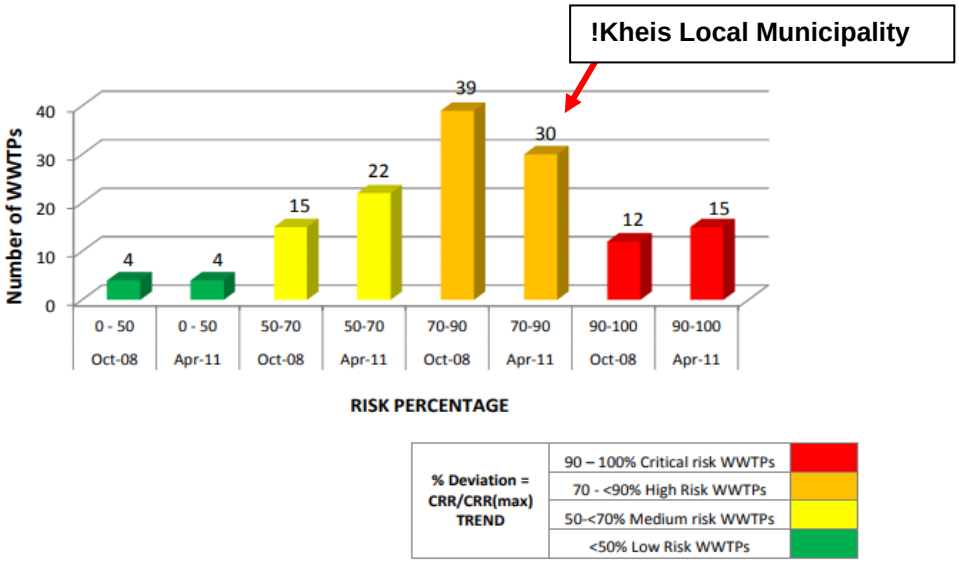

Figure 3. Results of Green Drop Score(2010/11)

!Kheis Local Municipality received a Green Drop Score Percentage of 8%, meaning the WWTWs in the Municipality are underperforming and pose a threat to the environment and public health.

• **Are the necessary services with adequate capacity currently available (at the time of application), or must additional capacity be created to cater for the development? (Confirmation by the relevant Municipality in this regard must be attached to the final Basic Assessment Report as Appendix I.)**	~~YES~~	**NO**	Please explain

Electricity:

As per the Engineering Services Investigation Report (Appendix D5), the bulk connection to the existing Gariep Settlement is via a 22kV overhead line fed from the Eskom 10MVA substation, located in Groblershoop. This substation is currently being upgraded to a 20MVA substation to be commissioned in December 2020. An additional load of 162KVA is expected (as per INEP guidelines) is expected to be required to service the proposed development. The Gariep community falls within the Eskom Distribution where the existing electrified households purchase electricity from Eskom and not he Municipality. It must be noted that although the existing feeder will be able to service the proposed development, the 162kVA load can only be serviced once the Groblershoop substation has been upgraded and brought online by Eskom's Network Planning Department.

Figure 4. Existing electrical infrastructure associated with the Gariep Settlement. Source: Engineering Services Investigation Report, August 2020 (prepared by Bvi Engineers).

Water:

As per the Engineering Services Investigation Report (Appendix D5), existing water infrastructure is summarized as:

- **A raw water river pump station delivering 6l/s:** A mobile pump station (fitted on a trailer) is utilized to extract water from the Orange River, delivering water at a rate of 6l/s;
- **A 950mm long, 90mm diameter PVC Class 6 raw water supply line between the river and the water purification works on the side of the village:** The suction point is located under the 1: 10-year flood due to a sand bank on the northern side of the river. Water is subsequently pumped to the purification plant (with a maximum flow rate of 6l/s) through a 950m long pipe (Class 6 PVC) with a diameter of 90mm to a 60m^3 raw water storage dam. This storage dam is located next to the Package Plant Water Treatment Works
- **The water treatment works**: an open raw water storage dam stores raw water extracted from the Orange River. This stored water is then pumped through a package-type water treatment plant (constructed in 2008, supply a rate of 2l/s) to a 110m^3, elevated sectional steel storage tank. A high lift pump station is then used to pump water to a an elevated, 10m^3 storage tank where stored water is subsequently distributed to the Gariep Settlement.

The majority of water infrastructure is manually operated (including the river pump, water treatment works, and reservoir levels) whereas the elevated storage tank is not operational and water meters and pressure gauges are out of service. The annual average daily demand (AADD) for the existing Gariep Settlement and proposed Gariep Settlement will be approximately 200.3m^3/d.

Based on the current state of the Gariep bulk water infrastructure and calculated AADD, the following figure (Figure 5) highlights recommendations made.

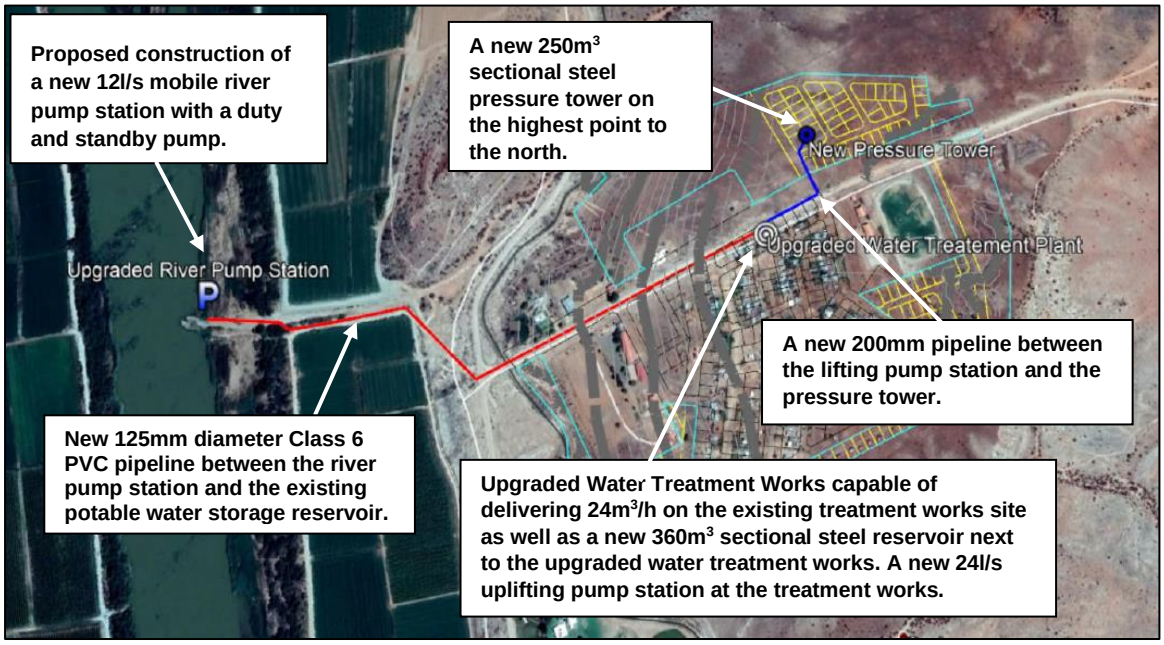

Figure 5. Recommended upgrades to existing bulk water infrastructure for the proposed Gariep Housing Development. Source: Engineering Services Investigation Report, August 2020.

Sewage:

According to the Engineering Services Investigation Report (Appendix D5), all existing households within the Gariep Settlement are serviced by Ventilated Improved Pit (VIP) toilets as no bulk sewer infrastructure is present. Should a full-borne sewerage system be required for the proposed Gariep Development, the system along with associated infrastructure (Figure 6, below) would be comprised of:

- Construction of two new sewer pump stations (Sewer Pump Stations No. 1 and No. 2) capable of delivering 6.7 l/s direct to the Wastewater Treatment plant;
- New 110mm diameter Class 6 PVC pipelines (2100m & 1300m) between the pump stations and a new Waste Water Treatment Plant (oxidation ponds), and
- Construction of a Wastewater Treatment Plant (oxidation ponds) with a capacity of 0.5Ml per day.

Figure 6. Proposed bulk sewerage system if required.

Currently, 288 sub-economic households are present within the existing Gariep Settlement, generates approximately 146 000l/day with a peak flow of 4.05l/s. Sewer Pump Station No. 1 will service the existing community whereas the second Sewer Pump Station No. 2 will service the proposed 135 households – generating 69 000l/day with a calculated peak flow of 3.63l/s.

Solid waste:

Solid waste, generated during construction activities, will be consolidated and disposed of by the local municipality. Waste receipts will be obtained by the applicant as proof of safe disposal.

Stormwater Management:

Gariep is a small settlement where stormwater drains from the centre of the site. According to the Engineering Services Investigation Report (Appendix D5), the guiding principle is that the peak stormwater runoff from the site, post construction, should not exceed the full range of storm return periods (1:2 to 1:50) of the site pre-construction. Stormwater infrastructure must be constructed to:

- Accommodate minor storm events (i.e. 1:5 years) in open channels or side drains of streets;
- Accommodate major storm events (i.e. 1:50 year) through controlled overland flows, aboveground attenuation storage, and berms at the higher end of the site; and
- Infrastructure must be constructed to prevent pooling of stormwater runoff;

Roads:

As per the Engineering Services Investigation Report (Appendix D5), access to the proposed development will be via existing Residential Collector Streets (Class 4b).

• **Is this development provided for in the infrastructure planning of the municipality, and if not what will the implication be on the infrastructure planning of the municipality (priority and placement of services and opportunity costs)? (Comment by the relevant Municipality in this regard must be attached to the final Basic Assessment Report as Appendix I.)**	**YES**	~~NO~~	Please explain

The !Kheis Local Municipality's aims to promote socioeconomic development through the eradication of backlogs associated with water and sanitation, electricity, and housing, as well as improve basic services within Gariep. In order to meet the needs of the community within Gariep, the Council resolved that a project business plan be submitted to COGHSTA as well as the construction of 135 houses in Gariep over the short to medium term. As per the !Kheis Integrated Development Plan (IDP) 2019/2020, a key performance indicator includes the provision of infrastructure and basic service through securing suitable land for human settlement projects. Suitable land was previously identified in Topline, Wegdraai, Grootdrink, Gariep, Opwag, and Boegoeberg. The provision of affordable housing units remains a high priority for the Municipality which will restore the dignity of poor people by providing shelter and access to basic human rights as enshrined in the Constitution of South Africa. The proposed Gariep Housing development is in line with the !Kheis IDPs key strategic and development objectives, namely, to improve and maintain basic service delivery through specific infrastructural projects including human settlements and basic services, in the poverty-stricken Gariep Township. As of 2011, the demographic profile of the KLM includes the total population of 16 637 individuals with a total number of 4 145 households. According to the SDF, Gariep had a population of 1558 in 2001, 2189 in 2011 and a projected population of 2073 in 2020. The exponential change rate between 2001 and 2011 was 0,01571. The rate of change between 2011 and 2020 is expected to be 11.6%. The houses required by 2020 are estimated to be 532 according to the SDF. Therefore, this community requires formalized, state-

instituted housing, and associated, infrastructure. The proposed development will distribute the density of the population, improve community member's standard of living, as well as access to essential services including roads, electricity, water supply, appropriate sewage disposal infrastructure, and environmental health in the area. Therefore, the proposed development will enable adequate housing to be constructed, thereby promoting access to basic service delivery as well as socioeconomic development in the Gariep Township and its surroundings. !Kheis Local Municipality is committed to the vision of the National Government of which it committed itself towards accelerating shared growth to halve poverty and unemployment and promote social inclusions. Housing is one of the social inclusions in this vision. !Kheis Local Municipality does however not have enough funding available to their disposal to finance this size project.			
• **Is this project part of a national programme to address an issue of national concern or importance?**	**YES**	~~NO~~	Please explain
The provision of affordable housing units remains a high priority for the Municipality which will restore the dignity of poor people by providing shelter and access to basic human rights as enshrined in the Constitution of South Africa.			
• **Do location factors favour this land use (associated with the activity applied for) at this place? (This relates to the contextualisation of the proposed land use on this site within its broader context.)**	**YES**	~~NO~~	Please explain
The proposed site for development is located adjacent to the existing Gariep township. Approximately 4.16ha of the proposed sites are either disturbed or transformed (informal housing). The remaining footprint, earmarked for development, is comprised of a very dry and reduced vegetation layer			
• **Is the development the best practicable environmental option for this land/site?**	**YES**	~~NO~~	Please explain
The best environmental option would be the no-go alternative as this would reduce the transformation of land surrounding the existing Gariep Township. However, as noted during the site visit, the site is disturbed with frequent occurrences of illegal dumping and plant harvesting (for firewood) and will continue. The illegal dumping of general and hazardous (e.g. used nappies, oil, etc.) waste negatively impacts the physical, chemical, and biological factors associated with the receiving environment[5]. Therefore, the formalization of the area surrounding the Gariep Township, including the construction of water and sanitation infrastructure, will benefit the receiving environment.			
• **Will the benefits of the proposed land use/development outweigh the negative impacts of it?**	**YES**	~~NO~~	Please explain
The !Kheis Local Municipality's aims to promote socioeconomic development through the eradication of backlogs associated with housing, water and sanitation, electricity, as well as improve basic services within Gariep. Therefore, the development of the land for housing is in line with the !Kheis IDPs key strategic and development objectives, namely, to improve and maintain basic service delivery through specific infrastructural projects including human settlements and basic services, in the poverty-stricken Gariep Township.			

[5] Malinowski, Mateusz, K. Wolny-Koladka, and B. Jastrzebski. "Characteristics of illegal dumping sites-case study: watercourses." Infrastruktura i Ekologia Terenów Wiejskich IV/4 (2015); Kapuku, J. "Investigation and analysis on key issues deteriorating water quality in a water-scarce country: Case of South Africa."

• **Will the proposed land use/development set a precedent for similar activities in the area (local municipality)?**	~~YES~~	**NO**	Please explain
Suitable land for housing development was previously identified in Topline, Wegdraai, Grootdrink, Gariep, Opwag, and Boegoeberg. It must be noted that as per the !Kheis Integrated Development Plan (IDP) 2019/2020, a key performance indicator includes the provision of infrastructure and basic service through securing suitable land for human settlement projects.			
• **Will any person's rights be negatively affected by the proposed activity/ies?**	~~YES~~	**NO**	Please explain
The rights of residents, local farmers, the community etc. are not expected to be negatively impacted as the proposed activity is expected to have positive impact on the Gariep Township and its surroundings. All interested and affected parties will be informed of all planning and phases of the proposed Gariep Housing development and their comments will be captured in the comments and responded to accordingly.			
• **Will the proposed activity/ies compromise the "urban edge" as defined by the local municipality?**	~~YES~~	**NO**	Please explain
The activity is not expected to compromise the urban edge.			
• **Will the proposed activity/ies contribute to any of the 17 Strategic Integrated Projects (SIPS)?**	**YES**	~~NO~~	Please explain
The project may contribute to the following SIPS (note **bold and underlined text** represents aspects of SIPS relevant to the proposed Gariep Housing development): • **SIP 7**: Integrated urban space and public transport programme (Integrated public transportation network such as commuter rail, taxis, buses, BRT, integrated ticketing and intelligent transport systems; **housing**; and **water and sanitation**); • **SIP 11:** Agri-logistics and rural infrastructure (Improve investment in agricultural and **rural infrastructure that supports expansion of production and employment**, small-scale farming and rural development, including facilities for storage, transport links to main networks, fencing of farms, irrigation schemes to poor areas, improved R&D on rural issues (including expansion of agricultural college colleges), processing facilities, aquaculture incubation schemes, and rural tourism infrastructure; • **SIP 12:** Revitalisation of public hospitals and other health facilities (**Refurbish hospitals and other public health facilities**); and • **SIP 18:** Water and sanitation infrastructure (Provide for **new infrastructure**, rehabilitation and **upgrading of existing infrastructure**, as well as improve management of water infrastructure).			
• **What will the benefits be to society in general and to the local communities?**			Please explain
The proposed Gariep Housing Development will benefit the society in general and to the local communities in the following ways: - Provision of housing. The construction of the proposed Gariep Housing development will also contribute to eradicate past political landscape spatial divides in human settlement patterns; - Socioeconomic development through the creation of employment and skills-development opportunities; - Increased access to basic services (roads, electricity, water supply, appropriate sewage disposal infrastructure).			

• **Any other need and desirability considerations related to the proposed activity?**	Please explain
N/A	
• **How does the project fit into the National Development Plan for 2030?**	Please explain
The proposed development falls in line with the National Development Plan 2030[6], with regards to promoting the development of housing relative to more compact developments to enable community members to access basic services and public spaces. Moreover, the National Development Plan aims to promote the development of infrastructure that supports human settlement and improving public services (water and sanitation, and roads).	
• **Please describe how the general objectives of Integrated Environmental Management as set out in section 23 of NEMA have been taken into account.**	
The general objectives of Integrated Environmental Management (namely to promote sustainable development through the integration of social, economic and environmental features as well as to address intra- and inter-generational equity) have been taken into account through the following: • The actual and potential impacts of the activity on the environment, socio-economic conditions, and cultural heritage, relative to the proposed site for development, have been identified, predicted, evaluated, as well as the risks and consequences of these impacts, site and technology alternatives. The proposed mitigation measures of activities, with a view to minimize negative impacts on the environment, socioeconomic conditions, and any cultural heritage, while maximizing benefits and promoting compliance with the principles of environmental management, were assessed (please refer to Section D). • The potential impacts associated with the development of the Gariep Housing Project on the environment have been identified, assessed, and mitigation measures proposed to reduce these impacts, before any construction activities have commenced (Appendix F). • The identification of potential temporary employment opportunities in order to promote socioeconomic development in the local community. • Comprehensive and adequate opportunity for public participation is ensured through the public participation process thereby integrating intra- and inter-generational input (Please refer to Appendix E). • The environmental features of the proposed site for development have been considered and evaluated in the management and decision-making of the activity. An EMP has been compiled and included (Appendix G) relative to the proposed activity, along with potential impacts and mitigation measures (as well as conditions stipulated by applicable state authorities which will be included), must be adhered to and implemented during the applicable phase of activity in order to reduce and mitigate identified impacts.	
• **Please describe how the principles of environmental management as set out in section 2 of NEMA have been taken into account.**	
The principles of environmental management, as per section 2 of the NEMA, have been taken into account. The principles pertinent to this activity include: • **Socioeconomic development**: People and their needs have been placed at the forefront while serving their physical, psychological, developmental, cultural, and social interests – the proposed activity is not expected to have any adverse effect on people. Temporary job employment and skills-development opportunities will be created during the construction of the project. • **Sustainable development**: Development must be socially, environmentally and economically sustainable. The environmental impacts associated with the proposed development will be minimized by implementing the proposed mitigation measures as per the EMPr and specialist recommendations (Appendix G). The identified impacts will be negated through good engineering practices and environmental advice. The social, economic and environmental impacts of the proposed activity have been considered, assessed and evaluated, including the disadvantages and benefits, and proposed mitigation measures which will be implemented (Appendix F).	

[6]National Development Plan, 2030. Accessed at https://www.gov.za/sites/default/files/Executive%20Summary-NDP%202030%20-%20Our%20future%20-%20make%20it%20work.pdf

- **Social and Environmental Awareness**: where waste cannot be avoided, sustainable waste management practices will be implemented. This includes the consolidation of generated waste, the separation of general and hazardous waste, separation and subsequent recycling of recyclable waste, safe storage of waste, and the disposal of stored waste at a registered disposal facility. Waste disposal receipts will be obtained as proof of safe disposal.
- **Responsible use and handling of non-renewable resources**: the storage and handling of non-renewable resources will be carried out responsibly in an environmentally and socially safe manner. No exploitation of non-renewable natural resources occurs with the proposed activity.
- **Environmental rights**: The negative impacts on the environment and on people's environmental rights have been predicted, identified, minimized, mitigated and prevented where applicable (**Appendix F**). The consequences of decisions on all aspects of the environment and all people in the environment have been taken into account, by pursuing what is considered the best practicable environmental option.
- **Transparent Public Participation Process:** The interests, needs and values of all interested and affected parties will be taken into account in decisions through the Public Participation Process (**Appendix E**).
- **Waste Management:** Sustainable waste management practices, namely reducing, re-using, and recycling, of waste generated on site will be implemented. This will reduce the proposed construction's impact, regarding waste generation and disposal, on the surrounding environment.

11) 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 (NEMA) and the Environmental Impact Assessment (EIA) Regulations 2014	The National Environmental Management Act (Act 107 of 1998) (NEMA) is South Africa's overarching environmental legislation. It includes a set of principles that govern environmental management and against which all Environmental Management Programmes (EMPr) and actions are measured. These principles include and relate to sustainable development, protection of the natural environment, waste minimisation, public consultation, the right to an environment that is not harmful to one's health or wellbeing, and a general duty of care. The Environmental Impact Assessment (EIA) Regulations, 2014: GNR.982, R.983, and R.985 under Section 24 of the NEMA define the activities that require Environmental Authorisation and the processes to be followed to assess environmental impacts and obtain Environmental Authorisation. Environmental authorisation is required for the construction of the Gariep Housing Development [Refer to Section A, Paragraph 1(b) for detail of applicable listed activities]; therefore, this application is in line with the requirements of NEMA.	DENC	This Application
National Water Act, Act 36 of 1998	A Water Use Authorisation is required in terms of section 21 of the National Water Act 36 of 1998. A NFEPA wetland is located within 500m of the proposed site for development whereas drainage lines of the Orange River are located within 100m of the site. The water uses that will be applied for include Section 21 (c) and (i). The WUA application will be submitted on the DWS eWULAAS online portal before the submission of the FBAR.	Department of Water and Sanitation (DWS)	In progress
National Environmental Management: Biodiversity Act 10 of 2004 (NEMBA)	To provide the framework, norms, and standards for the conservation, sustainable use and equitable benefit-sharing of South Africa's biological resources. Section 52 allows for the publication of a list of threatened ecosystems in need of protection. The list was published in Government Gazette No. 34809 Notice No. 1002, dated 9 November 2011. The site is located within the Lower Gariep Alluvial (EN) and Bushmanland Arid Grassland (LT). Therefore, the proposed application for environmental authorisation has included an assessment of the impact of the clearance of more than 1ha (but less than 20ha) of disturbed, indigenous vegetation within the Least Threatened ecosystem type, and more than 300m^2 of indigenous vegetation within an Endangered ecosystem type (i.e. 6551m^2 of indigenous vegetation within the endangered Lower Gariep Alluvial ecosystem type) and Critical Biodiversity Area (CBA).	DENC	N/A

Northern Cape Nature Conservation Act 9 of 2009 (NCNCA)	As per the Botanical Assessment (Appendix D1), a number of NCNCA protected species were identified on site including: *Aizoon burchellii, Aloe claviflora, Boscia albitrunca, Cynanchum viminale* (=*Sarcostemma viminale*), *Euphorbia braunsii,* and *Mesembryanthemum subnodosum* (=*Psilocaulon subnodosum).* The disturbance, removal, relocation, or destruction of protected plant species requires a permit from DENC as per the NCNCA.	DENC	To be submitted if needed.
National Forest Act, Act 84 of 1998	As per the Botanical Assessment, four (4) protected *Vachellia erioloba* trees and a number of protected Sheppard trees (*Boscia albitrunca*) and a number of Northern Cape Nature Conservation Act, protected species. Should any protected tree individual need to be disturbed, removed, relocated, or destroyed, a NFA tree permit is required from DAFF.	DAFF	To be submitted if needed.
National Heritage Resources Act, Act 25 of 1999 (NHRA)	For the protection of South African Heritage to nurture and conserve communities' legacy. The proposed site for development is above 5ha (5000m^2). Heritage Impact (HIA) and Paleontological Impact (PIA) Assessments have been conducted. As per the HIA, *no significant heritage sites or features were identified within the surveyed sections of Plot 113, Boegoebergnedersetting RE/48, Gariep Settlement. The Early/Middle Stone Age cultural material identified is not conservation worthy. No further mitigation is recommended with regards to these resources. Therefore, from a heritage point of view, we recommend that the proposed development can continue… Due to the low palaeontological significance of the area, no further palaeontological heritage studies, ground-truthing and/or specialist mitigation are required.*	SAHRA	In progress
The National Environmental Management: Waste Act, 2008 (Act No. 59 of 2008	The law regulating waste management to prevent pollution and ecological degradation. Section 19 allows the Minister to publish a list of activities, which require a Waste Management License. The most recent list is published in Government Gazette 37083 Notice No. 921 dated 29 November 2013. It is unlikely that any activities carried out by the development will trigger a Waste Management Activity.	DEA and DENC	N/A
Integrated Environmental Management Information Series	Criteria to be used for evaluating environmental impacts of the proposed activity during the NEMA EIA application process (a copy of the Integrated Environmental Management Information Series can be accessed at https://www.environment.gov.za/documents/strategies/integrated_environmentalmanagement_eim).	DENC	This application

By-laws of the !Kheis Local Municipality and Z.F. Mgcawu District Municipality	To be adhered to during the construction and operational phase.	Local and District Municipalities	In progress

12) WASTE, EFFLUENT, EMISSION AND NOISE MANAGEMENT

a) Solid waste management

Will the activity produce solid construction waste during the construction/initiation phase?	**YES**	~~NO~~
If YES, what estimated quantity will be produced per month?	Unknown m^3	

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

Waste generated on site during construction activities (concrete, plastic wrapping, and general waste) will be consolidated, adequately stored, and disposed of at a registered, municipal-approved waste disposal facility (with Municipal approval). Before disposal, general waste will be separated and recycled accordingly.

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

Waste generated on site during construction activities (concrete, plastic wrapping, and general waste) will be consolidated, adequately stored, and disposed of at a registered, municipal-approved waste disposal facility (with Municipal approval). Before disposal, general waste will be separated and recycled accordingly.

Will the activity produce solid waste during its operational phase?	**YES**	~~NO~~
If YES, what estimated quantity will be produced per month?	Unknown m^3	

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

Solid waste will be disposed of at a municipal approved waste disposal site.

If the solid waste will be disposed of into a municipal waste stream, indicate which registered landfill site will be used.

To be confirmed.

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

N/A

If the solid waste (construction or operational phases) will not be disposed of in a registered landfill site or be taken up in a municipal waste stream, then the applicant should consult with the competent authority to determine whether it is necessary to change to an application for scoping and EIA.

Can any part of the solid waste be classified as hazardous in terms of the NEM:WA?	~~YES~~	**NO**

If YES, inform the competent authority and request a change to an application for scoping and EIA. An application for a waste permit in terms of the NEM:WA must also be submitted with this application.

Is the activity that is being applied for a solid waste handling or treatment facility?	~~YES~~	**NO**

If YES, then the applicant should consult with the competent authority to determine whether it is necessary to change to an application for scoping and EIA. An application for a waste permit in terms of the NEM:WA must also be submitted with this application.

b) Liquid effluent

Will the activity produce effluent, other than normal sewage, that will be disposed of in a municipal sewage system?	~~YES~~	**NO**
If YES, what estimated quantity will be produced per month?		m^3
Will the activity produce any effluent that will be treated and/or disposed of on site?	~~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.

Will the activity produce effluent that will be treated and/or disposed of at another facility?	~~YES~~	**NO**

If YES, provide the particulars of the facility:

Facility name:			
Contact person:			
Postal address:			
Postal code:			
Telephone:		**Cell:**	
E-mail:		**Fax:**	

Describe the measures that will be taken to ensure the optimal reuse or recycling of waste water, if any:

N/A

c) Emissions into the atmosphere

Will the activity release emissions into the atmosphere other that exhaust emissions and dust associated with construction phase activities?	~~YES~~	**NO**
If YES, is it controlled by any legislation of any sphere of government?	~~YES~~	~~NO~~

If YES, the applicant must consult with the competent authority to determine whether it is necessary to change to an application for scoping and EIA.

If NO, describe the emissions in terms of type and concentration:

N/A

d) Waste permit

Will any aspect of the activity produce waste that will require a waste permit in terms of the NEM:WA?	~~YES~~	**NO**

If YES, please submit evidence that an application for a waste permit has been submitted to the competent authority - N/A

e) 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**

Describe the noise in terms of type and level:

Normal construction-related noise will occur but will be within construction hours as outlined in the EMPr and EA. The noise that will be generated is comparable to noise of other filling stations of the same size which will be negligible.

13) WATER USE – (AADD: 119.3M³/DAY)

Please indicate the source(s) of water that will be used for the activity by ticking the appropriate box(es):

~~Municipal~~	~~Water board~~	~~Groundwater~~	**River, stream, dam or lake**	~~Other~~	~~The activity will not use water~~

If water is to be extracted from groundwater, river, stream, dam, lake or any other natural feature, please indicate the volume that will be extracted per month:	To be confirmed.	
Does the activity require a water use authorisation (general authorisation or water use license) from the Department of Water Affairs?	**YES**	~~NO~~
If YES, please provide proof that the application has been submitted to the Department of Water Affairs.		

Proof of the application will be attached to the Final BAR.

14) ENERGY EFFICIENCY

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

The existing Gariep Settlement falls under the Eskom Distribution area. An additional 162kVA load (as per INEP Guidelines) will be required for the proposed development. The current 22kV overhead line, fed from the 10MVA Groblershoop substation (currently being upgraded to 20MVA substation), will be able to service the future, additional 162kVA load.

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

At present no viable alternative energy sources are available.

SECTION B: SITE/AREA/PROPERTY DESCRIPTION

Important notes:

- For linear activities (pipelines, etc.) as well as activities that cover very large sites, it may be necessary to complete this section for each part of the site that has a significantly different environment. In such cases please complete copies of Section B and indicate the area, which is covered by each copy No. on the Site Plan.

Section B Copy No. (e.g. A):	

- Paragraphs 1 - 6 below must be completed for each alternative.

- Has a specialist been consulted to assist with the completion of this section? **YES** ~~NO~~

If YES, please complete the form entitled "Details of specialist and declaration of interest" for each specialist thus appointed and attach it in Appendix I. All specialist reports must be contained in Appendix D.

Property description/physical address:	**Province**	Northern Cape Province	
	District Municipality	Z. F. Mgcawu District Municipality	
	Local Municipality	!Kheis Local Municipality	
	Ward Number(s)	2	
	Farm name and Number	Erf 113 of Gariep Settlement	
	SG Code	Erf 113, Gariep Settlement	C02800030000011300000
	Where a large number of properties are involved (e.g. linear activities), please attach a full list to this application including the same information as indicated above.		
Current land-use zoning as per local municipality IDP/records:	Agriculture		
	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~~

1) GRADIENT OF THE SITE

Indicate the general gradient of the site.

Alternative S1 (Preferred):

~~Flat~~	**1:50 – 1:20 Average**	~~1:20 – 1:15~~	~~1:15 – 1:10~~	~~1:10 – 1:7,5~~	~~1:7,5 – 1:5~~	~~Steeper than 1:5~~

Alternative S2 (if any):

~~Flat~~	~~1:50 – 1:20 Average~~	~~1:20 – 1:15~~	~~1:15 – 1:10~~	~~1:10 – 1:7,5~~	~~1:7,5 – 1:5~~	~~Steeper than 1:5~~

Alternative S3 (if any):

~~Flat~~	~~1:50 – 1:20 Average~~	~~1:20 – 1:15~~	~~1:15 – 1:10~~	~~1:10 – 1:7,5~~	~~1:7,5 – 1:5~~	~~Steeper than 1:5~~

2) LOCATION IN LANDSCAPE

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

~~2.1 Ridgeline~~		~~2.4 Closed valley~~		~~2.7 Undulating plain / low hills~~	
~~2.2 Plateau~~		~~2.5 Open valley~~		~~2.8 Dune~~	
~~2.3 Side slope of hill/mountain~~		2.6 Plain	**X**	~~2.9 Seafront~~	
~~2.10 At sea~~					

3) GROUNDWATER, SOIL AND GEOLOGICAL STABILITY OF THE SITE

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

The following specialist assessments were conducted:
Appendix D1 – Botanical Assessment Report
Appendix D2 – Freshwater Assessment Report
Appendix D3 – Heritage Impact Assessment (HIA) – As per the HIA, "*due to the low palaeontological significance of the area, no further palaeontological heritage studies, ground-truthing and/or specialist mitigation are required. It is considered that the development of the proposed development is deemed appropriate and feasible and will not lead to detrimental impacts on the palaeontological resources of the area (Butler 2020)*".
Appendix D4 – Geotechnical Investigation

The findings and recommendations of these reports have been included in this BAR.

	Alternative A1		**Alternative A2**		**Alternative A3**		**Alternative A4**	
Shallow water table (less than 1.5m deep)	~~YES~~	**NO**	YES	NO	YES	NO	YES	NO
Dolomite, sinkhole or doline areas	~~YES~~	**NO**	YES	NO	YES	NO	YES	NO
Seasonally wet soils (often close to water bodies)	~~YES~~	**NO**	YES	NO	YES	NO	YES	NO
Unstable rocky slopes or steep slopes with loose soil	~~YES~~	**NO**	YES	NO	YES	NO	YES	NO
Dispersive soils (soils that dissolve in water)	~~YES~~	**NO**	YES	NO	YES	NO	YES	NO
Soils with high clay content (clay fraction more than 40%)	~~YES~~	**NO**	YES	NO	YES	NO	YES	NO
Any other unstable soil or geological feature	~~YES~~	**NO**	YES	NO	YES	NO	YES	NO
An area sensitive to erosion	~~YES~~	**NO**	YES	NO	YES	NO	YES	NO

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.

As per the **Geotechnical Investigation (Appendix D4)**:
The Geotechnical Specialist designated the proposed site for development the following site classes:

Geotechnical Zone I: zone is classed as R (i.e. proposed horizon for founding is stable and negligible soil movement is expected) where this zone makes up 87% of the proposed area for development. The viable foundation alternative is founding by conventional strip foundations. The slope across the zone ranges from 2 – 6%.

Geotechnical Zone II: zone is classed as R (i.e. proposed horizon for founding is stable and negligible soil movement is expected) where this zone makes up 6% of the proposed area for development. Two foundation design alternatives are applicable to this zone, namely the conventional strip foundation or

the slab-on-the-ground foundations (placed directly on bedrock or on very deep pedocrete). The slope across the zone is less than 2%.

Geotechnical Zone III: zone is classed as S (i.e. proposed horizon for founding is slightly compressible and rapid settlement less than 10mm is expected) where this zone makes up ~2.5% of the proposed area for development. Two foundation design alternatives are applicable to this zone, namely the conventional strip foundation or the slab-on-the-ground foundations (placed directly on medium dense terrace gravels. The slope across the zone ranges from 2 – 6%.

Geotechnical Zone IV: zone is classed as S (i.e. proposed horizon for founding is slightly compressible and rapid settlement less than 10mm is expected) where this zone makes up 4% of the proposed area for development. Two foundation design alternatives are applicable to this zone, namely the conventional strip foundation or the slab-on-the-ground foundations (placed directly on medium dense terrace gravels. The slope across the zone is less than 2%.

Geohydrological description as per the Geotechnical Investigation (Appendix D4):
Perched water was not encountered during the geotechnical site investigation. The Geotechnical specialist concluded that perched water is not anticipated to be problematic on the site. Groundwater is expected to occur at depths less than 15m in compact, argillaceous strata. Probability of drilling for water in the area ranges from 40 – 60% where the probability of finding a borehole which produces more than 2l/s ranges between 10 – 20%. The non-perennial watercourses may be regarded as being of lesser importance and do not require any additional precautionary measures to ensure safety of the population against flooding.

The geotechnical Specialist concluded that the entire area is regarded as being of intermediate suitability for residential development.

4) GROUNDCOVER

Indicate the types of groundcover present on the site. The location of all identified rare or endangered species or other elements should be accurately indicated on the site plan(s).

~~Natural veld - good condition~~[E]	**Natural veld with scattered aliens**[E]	~~Natural veld with heavy alien infestation~~[E]	~~Veld dominated by alien species~~[E]	~~Gardens~~
~~Sport field~~	**Cultivated land (Previously Cultivated)**	~~Paved surface~~	**Building or other structure**	**Bare soil**

Please see Appendix B for Site Photographs and further descriptions of site vegetation.

If any of the boxes marked with an "[E] "is ticked, please consult an appropriate specialist to assist in the completion of this section if the environmental assessment practitioner doesn't have the necessary expertise.

Botanical Assessment (Appendix D1)

Land Use and Cover:

Of the proposed 15ha footprint earmarked for development;

- ~3.27ha comprised of previously established informal households (refer to Photo 2 - 4 of the Needs and Desirability Report – Appendix D6);
- ~1.87ha include areas of physical disturbance including excavated areas and areas where waste (general and hazardous) has been illegally dumped;
- ~9.86ha include areas comprising of degraded veld with footpaths and grazing paths.
    - Site I: the only site supporting indigenous vegetation. Due to the topography of the area, namely above the Orange River floodplain, the vegetation was characteristic of Bushmanland Arid Grassland compared with Lower Gariep Alluvial vegetation;
    - Site II: area was disturbed and comprised of open, trampled terrain with sparse shrubland. This site supported a low species diversity which may have been attributed to overgrazing, proximity to urban edge, and current drought;
    - Site III: large portions of this site were disturbed or levelled where remainder of site supports very sparse shrubland with low species diversity.

5) SURFACE WATER

Indicate the surface water present on and or adjacent to the site and alternative sites?

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

If any of the boxes marked YES or UNSURE is ticked, please provide a description of the relevant watercourse.

The Freshwater Specialist identified one drainage line located adjacent to, and touching, the eastern and southern boundary of the development footprint. A section of this drainage line is located within the proposed site for development (Appendix A). The instream and riparian Present Ecological State (PES) of the drainage line were both classified as Class D, characterized as largely modified with a significant loss of natural habitat, biodiversity, and ecosystem functioning. The Ecological Importance (EI) of the drainage line (in close proximity to the site) is based on the presence of threatened fish species. As the non-perennial drainage line was dry at the time of the site visit, the EI could not be measured. No endangered fauna or flora were present along the drainage line.

6) LAND USE CHARACTER OF SURROUNDING AREA

Indicate land uses and/or prominent features that currently occur within a 500m radius of the site and give description of how this influences the application or may be impacted upon by the application:

Natural area	~~Dam or reservoir~~	~~Polo fields~~
~~Low density residential~~	~~Hospital/medical centre~~	**Filling station [H] ***
Medium density residential	**School**	~~Landfill or waste treatment site~~
~~High density residential~~	~~Tertiary education facility~~	~~Plantation~~
Informal residential [A]	~~Church~~	**Agriculture**
~~Retail commercial & warehousing~~	~~Old age home~~	**River, stream or wetland**
~~Light industrial~~	**Sewage treatment plant [A]**	~~Nature conservation area~~
~~Medium industrial [AN]~~	~~Train station or shunting yard [N]~~	~~Mountain, koppie or ridge~~
~~Heavy industrial [AN]~~	~~Railway line [N]~~	~~Museum~~
~~Power station~~	~~Major road (4 lanes or more) [N]~~	~~Historical building~~

~~Office/consulting room~~	~~Airport~~ [N]	~~Protected Area~~
~~Military or police base/station/compound~~	~~Harbour~~	~~Graveyard~~
~~Spoil heap or slimes dam~~ [A]	**Sport facilities**	~~Archaeological site~~
~~Quarry, sand or borrow pit~~	~~Golf course~~	Other land uses (describe) – **Irrigation canal**
*Please note, an old, decommissioned filling station is present outside of the development footprint. The proposed development is not expected to impact the filling station due to the nature of construction activities and the distance (~260m) from any construction activities.		

If any of the boxes marked with an "[N] "are ticked, how this impact will / be impacted upon by the proposed activity? Specify and explain:

N/A

If any of the boxes marked with an "[An]" are ticked, how will this impact / be impacted upon by the proposed activity? Specify and explain:

N/A

If any of the boxes marked with an "[H]" are ticked, how will this impact / be impacted upon by the proposed activity? Specify and explain:

An old, decommissioned filling station is present outside of the development footprint. The proposed development is not expected to impact the filling station due to the nature of construction activities and the distance (~260m) from any construction activities.

Does the proposed site (including any alternative sites) fall within any of the following:

Critical Biodiversity Area (as per provincial conservation plan) **(Refer to Figure 7 below)**	**YES**	~~NO~~
Core area of a protected area?	~~YES~~	**NO**
Buffer area of a protected area?	~~YES~~	**NO**
Planned expansion area of an existing protected area?	~~YES~~	**NO**
Existing offset area associated with a previous Environmental Authorisation?	~~YES~~	**NO**
Buffer area of the SKA?	~~YES~~	**NO**

If the answer to any of these questions was YES, a map indicating the affected area must be included in Appendix A.

Figure 7: Critical Biodiversity Areas (CBA) associated with the proposed site for development. Source: QGIS, version 3.10.

7) CULTURAL/HISTORICAL FEATURES

Are there any signs of culturally or historically significant elements, as defined in section 2 of the National Heritage Resources Act, 1999, (Act No. 25 of 1999), including Archaeological or paleontological sites, on or close (within 20m) to the site? If YES, explain:	~~YES~~	**NO**
	Uncertain	

A Heritage Impact Assessment (HIA) was conducted and report prepared by Ubique Heritage Consultants in June 2020 (Appendix D3).

As per the HIA,

1. **<u>No significant heritage sites or features were identified within the surveyed sections</u>**. The Early/Middle Stone Age cultural material identified by the Specialist were not considered of conservational value. No further mitigation is recommended with regards to these resources. Therefore, from a heritage point of view, the specialist recommended that the proposed development can continue.
2. The Gariep cemeteries are situated outside the development footprint. These sites are graded as IIIB and are of High Local Significance. No further mitigation is recommended with regards to these resources. **No other graves were identified within the development footprint.**
3. Due to the **low palaeontological significance** of the area, **<u>no further</u> palaeontological heritage studies, ground-truthing and/or specialist mitigation are required**. It is considered that the development of the proposed development is deemed appropriate and feasible and will not lead to detrimental impacts on the palaeontological resources of the area (Butler 2020).

If uncertain, conduct a specialist investigation by a recognised specialist in the field (archaeology or palaeontology) to establish whether there is such a feature(s) present on or close to the site. Briefly explain the findings of the specialist:
N/A

Will any building or structure older than 60 years be affected in any way?	~~YES~~	**NO**
Is 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 provide proof that this permit application has been submitted to SAHRA or the relevant provincial authority.		

8) SOCIO-ECONOMIC CHARACTER

a) Local Municipality

Please provide details on the socio-economic character of the local municipality in which the proposed site(s) are situated.

Level of unemployment:

As per the !Kheis Local Municipality, Land Development Plan/ Rural Spatial Development Framework, (2014), the unemployment levels in 1996 was 21.6%, which decreased by -1.5% (2001) and subsequently increased by 8% to a total of 28.1% in 2011. See comparison of unemployment rate between !Kheis Local Municipality (KLM), ZF Mgcawu District Municipality (ZFM DM), and the Northern Cape Province (NCP) below. Although the unemployment rate in KLM was below the ZFM DM and Provincial averages between 1996-2001, the unemployment rate was higher than the ZFM DM and equal to the Provincial average in 2011.

Table 1. Unemployment rate comparisons between KLM, ZFM DM, and the NCP.

Unemployment Rate	1996	2001	2011
KLM	21,6	20,1	28,1
ZFM DM	24,5	26,5	21,0
NCP	32,4	35,7	28,1

Although the SDF (2014) does not stipulate the employment rate of Gariep, neighbouring informal townships were identified. For example, in 2011 the KLM settlements, namely Wegdraai (32.5%), Topline (42.8%), and Boegoeberg (51.7%) possessed the lowest employment rates in the KLM (see Table 2 below). These averages were below the total employment rate for the KLM.

Table 2. Official employment status of those aged between 15 and 64 per settlement in the !Kheis LM (2011)[7].

Settlement	Employed (%)	Unemployed (%)	Discouraged work-seeker	Other not economically active*
Grootdrink	82,3	17,7	4	35
!Kheis NU	89,4	10,6	3	30
Topline	42,8	57,2	6	41
Wegdraai	32,5	67,5	9	47
Groblershoop	77,0	23,0	6	41
Boegoeberg	51,7	48,3	6	42
KLM	**72**	**28,0**	**5**	**39**
ZFM DM	80,8	19,2	3	38
Northern Cape	72,6	27,4	5	42

* 'Other not economically active': People aged between 15 and 64 who are not available for work such as full-time scholars and students, full-time homemakers, those who are retired and those who are unable or unwilling to work

[7] Land Development Plan/ Rural Spatial Development Framework, 2014.

Labour participation rate in the economy is low (ranges between 43.8-66.5%) whereas Topline, Wegdraai and Boegoeberg have the highest unemployment rate along with the lowest rate of labour force participation.

Table 3. Number of people unemployed at a Settlement, Local (!Kheis) and District (ZFM) Municipality, and Provincial (NC) level.

	Employed	Unemployed	Labour force	Unemploy-ment rate	LFPR*
Grootdrink	723	156	879	17,7%	60,5%
!Kheis NU	1435	170	1605	10,6%	66,5%
Topline	193	258	451	57,2%	52,7%
Wegdraai	173	359	532	67,5%	43,8%
Groblershoop	1252	373	1625	23,0%	52,9%
Boegoeberg	272	254	526	48,3%	51,6%
KLM	**4047**	**1570**	**5617**	**28,0%**	**56,0%**
ZFM DM	74449	17696	92145	19,2%	58,6%
Northern Cape	282791	106723	389514	27,4%	52,9%

*LFPR: Labour Force Participation Rate

Therefore, with regards to the rate of unemployment and labour force participation rates, the proposed housing development will promote socioeconomic development within the KLM through employment and skills-development, as well as housing opportunities.

Economic profile of local municipality:

The main sectors (and occupations) contributing to the GDP of the ZF Mgcawu District Municipality are agriculture, forestry, and fishing (see Figure 8 below). Agriculture-based occupations are generally in the form of seasonal manual labour on farms and are concentrated in areas along the Orange River. The lowest sector contributing to the ZFM DM's GDP, was mining and electricity production. The Gariep Settlement, along with the proposed site of development, is located near the Orange River and associated activities presenting employment opportunities may include, but are not limited to, agricultural, construction, and recreational employment opportunities.

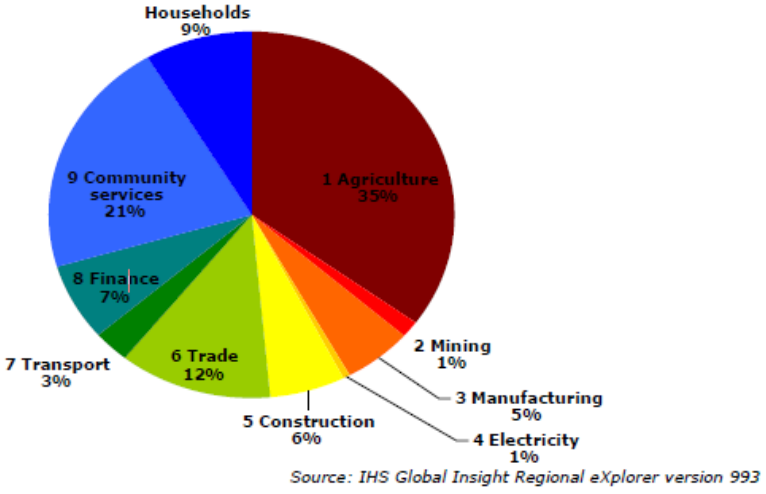

Figure 8. Employment composition, relative to various sectors, within the !Kheis Local Municipality contributing to the ZF Mgcawu DM's GDP.

As per the Comparative Analysis for the ZF Mgcawu District Municipality, (2017)[8], KLM was the second lowest contributing LM to the overall GDP of the ZF Mgcawu DM between 2005 and 2015 (see Figure 9 below).

[8] Comparative Analysis for the ZF Mgcawu District Municipality, 2017, Northern Cape Provincial Treasury.

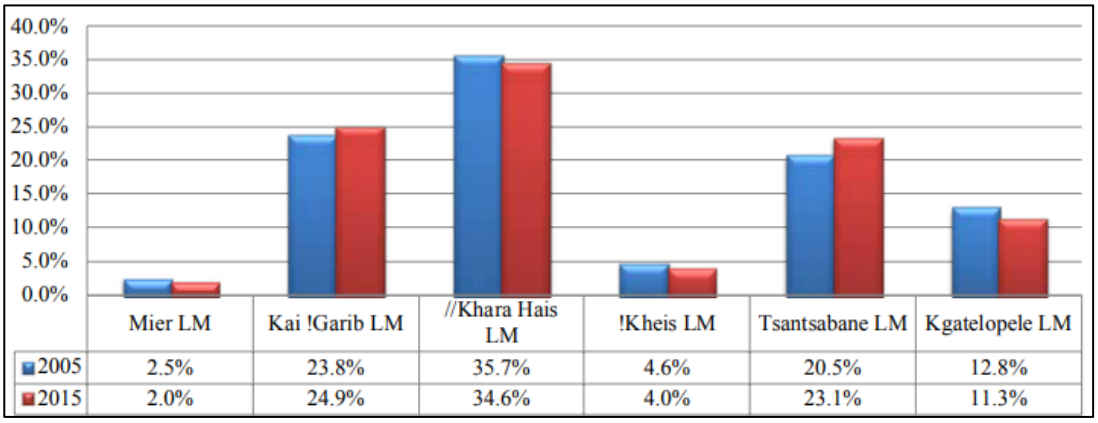

Figure 9. GDP contributions of Local Municipalities to the overall GDP of the ZF Mgcawu DM. Source: Global Insight, (2016) – version 933, 2.5v.

Level of education:

Within the KLM, the number of individuals aged 20 years and older, with no schooling decreased from 26.8% (1996) to 22.2% (2001) to 13.3% (2011). Although the percentage of individuals with no schooling decreased over time, these percentages are higher compared with the ZF Mgcawu DM and the Northern Cape Province (see Table 4 below). Although the number of individuals who received Grade 12 Matric certification increased over the time, the percentage of individuals were still lower than the ZF Mgcawu DM statistics in 2011 (see below).

Table 4. Percentage of population, within the !Kheis Local Municipality, aged 20 years and older, relative to level of education attained.

	1996	2001	2011
KLM			
No schooling	26,8	22,2	13,3
Complete primary	11,6	10,8	9,8
Grade 12	6,6	10,4	13,8
Higher	4,0	3,8	4,5
ZFM DM			
No schooling	19,8	16,5	9,4
Complete primary	5,9	9,3	7,3
Grade 12	6,5	15,8	21,3
Higher	3,9	4,7	3,2
Northern Cape			
No schooling	22,7	19,3	11,1
Complete primary	8,5	8,0	6,4
Grade 12	11,1	15,8	22,2
Higher	6,2	5,9	7,5

b) Socio-economic value of the activity

What is the expected capital value of the activity on completion?	Not Yet Determined*	
What is the expected yearly income that will be generated by or as a result of the activity?	Not Yet Determined*	
Will the activity contribute to service infrastructure?	**YES**	~~NO~~
Is the activity a public amenity?	**YES**	~~NO~~
How many new employment opportunities will be created in the development and construction phase of the activity/ies?	Not Yet Determined*	

What is the expected value of the employment opportunities during the development and construction phase?	Not Yet Determined*
What percentage of this will accrue to previously disadvantaged individuals?	~ 100%
How many permanent new employment opportunities will be created during the operational phase of the activity?	Not Yet Determined*
What is the expected current value of the employment opportunities during the first 10 years?	Not Yet Determined*
What percentage of this will accrue to previously disadvantaged individuals?	Not Yet Determined*

***A Project Steering Committee (PSC) has been established for the human settlements project. The PSC will draft a list of criteria to be used in the selection process of employing local labourers. This list will be included in the contract documentation as a guideline for the appointed contractor on their employment policy. Aspects which will receive special consideration in the list of criteria are gender equality, use of local labour, unemployed residents, single-headed households, youth and women employment.**

9) BIODIVERSITY

Please note: The Department may request specialist input/studies depending on the nature of the biodiversity occurring on the site and potential impact(s) of the proposed activity/ies. To assist with the identification of the biodiversity occurring on site and the ecosystem status 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. A map of the relevant biodiversity information (including an indication of the habitat conditions as per (b) below) and must be provided as an overlay map to the property/site plan as Appendix D to this report.

a) Indicate the applicable biodiversity planning categories of all areas on site and indicate the reason(s) provided in the biodiversity plan for the selection of the specific area as part of the specific category)

Systematic Biodiversity Planning Category				If CBA or ESA, indicate the reason(s) for its selection in biodiversity plan
Critical Biodiversity Area (CBA)	~~Ecological Support Area (ESA)~~	~~Other Natural Area (ONA)~~	~~No Natural Area Remaining (NNR)~~	CBA – Terrestrial

b) Indicate and describe the habitat condition on site (will be described once assessments have been received)

Habitat Condition	Percentage of habitat condition class (adding up to 100%)	Description and additional Comments and Observations (including additional insight into condition, e.g. poor land management practises, presence of quarries, grazing, harvesting regimes etc).
Natural		
Near Natural (includes areas with low to moderate level of alien invasive plants)	~72.26%	**Site I**: only site supporting notable indigenous vegetation. Due to the topography of the area, namely above the Orange River floodplain, the vegetation was characteristic of Bushmanland Arid Grassland compared with Lower Gariep Alluvial vegetation; **Site II**: sites II and III were disturbed. Site II comprised of open, trampled terrain with sparse shrubland and supported a low species diversity (which may have been attributed to overgrazing, proximity to urban edge, and current drought); **Site III**: large portions of this site were disturbed or transformed (e.g. levelled) where remainder of site supported very sparse shrubland with low species diversity.
Degraded (includes areas heavily invaded by alien plants)		
Transformed (includes cultivation, dams, urban, plantation, roads, etc)	~27.73%	Comprised of previously established informal households and areas of physical disturbance including excavated areas and areas where waste (general and hazardous) has been illegally dumped.

c) Complete the table to indicate:

(i) the type of vegetation, including its ecosystem status, present on the site; and
(ii) whether an aquatic ecosystem is present on site.

Terrestrial Ecosystems		Aquatic Ecosystems						
Ecosystem threat status as per the National Environmental Management: Biodiversity Act (Act No. 10 of 2004)	~~Critical~~ **Endangered** ~~Vulnerable~~ **Least Threatened**	Wetland (including rivers, depressions, channelled and unchanneled wetlands, flats, seeps pans, and artificial wetlands)			Estuary		Coastline	
		~~YES~~	**NO**	~~UNSURE~~	~~YES~~	**NO**	~~YES~~	**NO**

Please note that a drainage line is located adjacent to and touches the boundary of the proposed site for development. Thus, a section of the drainage line is located within the proposed site for development.

d) Please provide a description of the vegetation type and/or aquatic ecosystem present on site, including any important biodiversity features/information identified on site (e.g. threatened species and special habitats)

BIODIVERSITY

A section (6551m^2) of the site falls within the Lower Gariep Alluvial, an endangered (EN) ecosystem type, whereas the remainder of the site (~143 449m^2) falls within a Least Threatened (LT) ecosystem type, namely the Bushmanland Arid Grassland[9;10]. A NFEPA wetland, associated with the Orange River, is located within 500m of the proposed site for development. The following information was taken from the Botanical Assessment conducted by PB Consult (Appendix D1).

Vegetation

As per the Botanical Assessment Report (Appendix D1), approximately 4.16ha of the proposed sites are either disturbed or transformed (informal housing). The remaining footprint, which has been earmarked for development, is comprised of a very dry and reduced vegetation layer. Site I still supported remaining natural vegetation in relatively good condition whereas Sites II and III are disturbed and supported a disturbed and sparse vegetation layer. Although Site I is located in the Lower Gariep Alluvial Vegetation Type (EN), the area is physically elevated above the Orange River which may have contributed to the vegetation encountered on site, namely vegetation characteristic of the Bushmanland Arid Grassland. The site supported a sparse low shrubland situated on shallow soils. *Boscia albitrunca* (Sheppard trees) and *Vachellia erioloba* trees (Camel thorns) were observed within the development footprint however, Sheppard trees were in a poor condition (mostly reduced to shrubby individuals less than 1.5 m in height). The two (2) Camel thorn (*Vachellia erioloba*) trees were both relatively young (approximately 1.8 m in height). *Senegalia mellifera* were also observed in bush clumps together with other larger shrubs like *Phaeoptilum spinosum, Cynanchum viminale* and *Rhigozum trichotomum* and the *Mesembryanthemum subnodosum* (a plant species characteristic of disturbed areas). The alien invasive *Prosopis* tree was present throughout the site and was identified as a serious invader in the area and within the proposed site for development.

Site I: Vegetation encountered in Site I was described as low open shrubland (<0.75 m in height) dominated by white grasses and the shrubs *Aptosimum spinescens, Justicia australis and Tetraena decumbens*. The specialist noted the dried-out remains of numerous shrubs encountered on site. As a result species diversity were low, but the following plants were also observed, namely: a low growing shrub that is likely to be *Aptosimum*

[9] National List of Ecosystems that are threatened and in need of protection, Section 52 of the Biodiversity Act, GN 1002 of 9 December 2012.
[10] Mucina, L. and Rutherford, M.C., 2006. The vegetation of South Africa, Lesotho and Swaziland. Strelitzia 19.,(South African National Biodiversity Institute: Pretoria, South Africa). Memoirs of the Botanical Survey of South Africa.

albomarginatum, Blepharis mitrata, Geigeria ornativa, Kleinia longiflora, *Leucosphaera bainesii*, and even the low growing herb *Limeum aethiopicum, Rogeria longiflora* and *Tetraena rigida*.

Site II: Vegetation identified and observed on Sites II and III included an open trampled terrain with only a very sparse low shrubland (of low species diversity) remaining. This low species diversity was attributed to a combination of factors including overgrazing by livestock, human activities (including illegal dumping), as well as the current drought conditions. Grasses were less common and the vegetation seemed to be reduced to hardy or pioneer species. The alien invasive *Prosopis* trees were present throughout the site.

Site III: Large portions of Site III were previously disturbed or transformed by the levelling of sections of the land. The vegetation present in the remainder of the site was characterized as sparse shrubland, with a low species diversity, and dominated by short white grasses. Vegetation encountered included *Aptosimum spinescens*, with *Justicia australis* and *Tetraena decumbens*. A plant that is believed to be *Aptosimum albomarginatum* was also prominent. *Leucosphaera bainesii, Rhigozum trichotomum*, *Rogeria longiflora* and *Senegalia mellifera* were still encountered, whilst *Aloe claviflora*, *Aizoon burchellii*, *Euphorbia braunsii, Quaqua species* (3 individuals observed) *Salsola zeyheri* and *Tetraena macrocarpa* were also observed within the development footprint. An application, to obtain a plant permit, must be submitted to DENC, should any plant species of conservational value, e.g. *Aloe claviforium*, need to be disturbed or relocated. This will protect the biodiversity value of the site and surrounding area and is in line with the conservational aim of CBA priority networks. Mitigation measures and recommendations made by specialists, stipulated in the EA, BAR and EMPr, must be implemented.

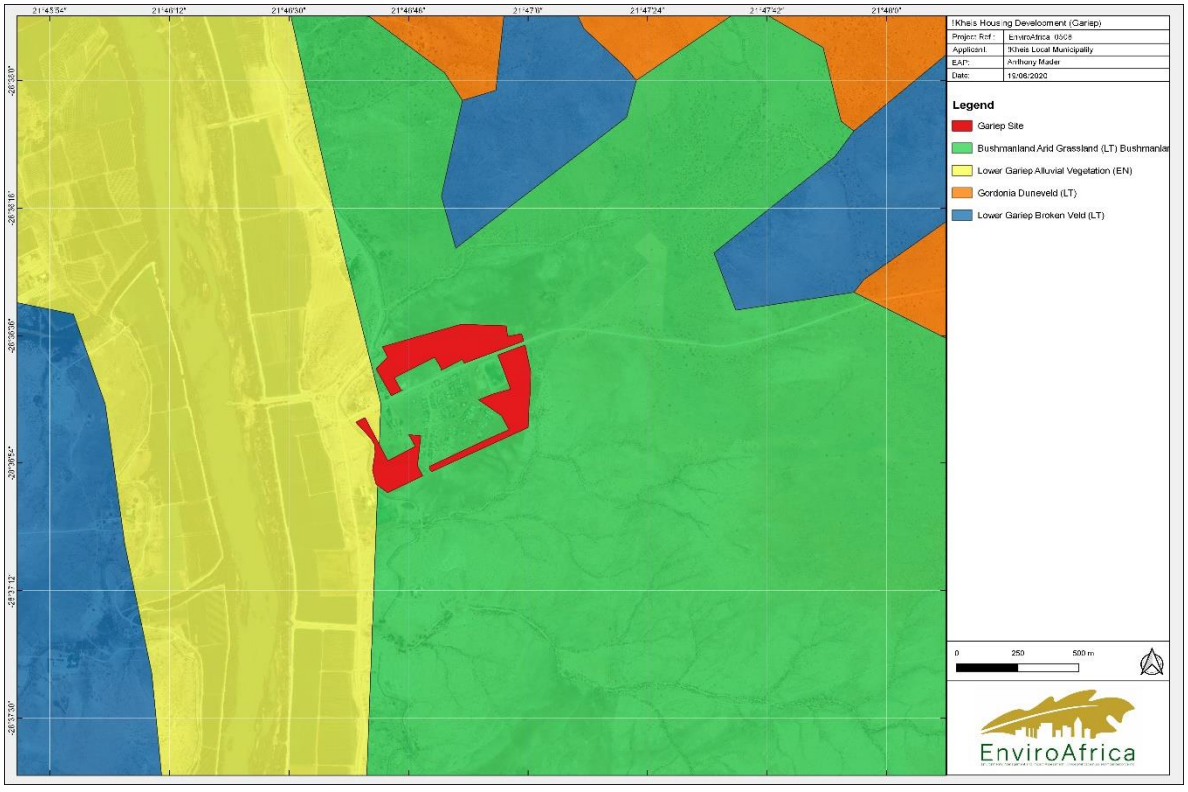

Figure 10: Vegetation map indicating the development footprint in red. Source: QGIS, version 3.10.

Critical Biodiversity Area priority network (Appendix A4)

According to the 2016 Northern Cape Critical Biodiversity Areas[11], the site is located within a CBA, namely CBA1 and CBA2 (Figure 7). The proposed development will result in the clearance of a combination of indigenous and alien vegetation, as well as sites where illegal dumping has taken place, within these Areas. Include degree of disturbance/ transformation from specialist reports.

[11] http://bgisviewer.sanbi.org/Html5Viewer/Index.html?configBase=http://bgisviewer.sanbi.org/Geocortex/Essentials/REST/sites/2016_NorthernCape_CBA/viewers/Northern_Cape/virtualdirectory/Resources/Config/Default&user=&extent=&layerTheme=

Plant species of conservational importance:

Threatened and Protected plant species

According to the Botanical Assessment (App D1), major threats to South African flora include habitat loss (e.g. infrastructure development, urban expansion, crop cultivation, and mining), invasive alien plant infestation (e.g. outcompeting indigenous plant species for resources), habitat degradation (e.g. overgrazing), unsustainable and illegal harvesting of indigenous plant species, pollution (e.g. sewage discharge into the environment), loss of pollinators or dispersers, climate change and natural disasters (e.g. such as droughts and floods).

In the Northern Cape, species of conservation concern are also protected in terms of national and provincial legislation, namely:

- **The National Environmental Management:** Biodiversity Act, Act 10 of 2004, provides for the protection of species through the "Lists of critically endangered, endangered, vulnerable and protected species" (GN. R. 152 of 23 February 2007).
- **National Forest Act, Act 84 of 1998**, provides for the protection of forests as well as specific tree species through the "List of protected tree species" (GN 908 of 21 November 2014).
- **Northern Cape Nature Conservation Act, Act of 2009**, provides for the protection of "specially protected species" (Schedule 1), "protected species" (Schedule 2) and "common indigenous species" (Schedule 3).

The Red List of South African Plants online provides up to date information on the national conservation status of South Africa's indigenous plants (SANBI, 2015).

- No red-listed species was observed.

NEM: BA protected plant species

The National Environmental Management: Biodiversity Act, Act 10 of 2004, provides for the protection of species through the "Lists of critically endangered, endangered, vulnerable and protected species" (GN. R. 152 of 23 February 2007).

- No **NEM: BA** protected species was observed.

NFA Protected plant species

The National Forests Act (NFA) of 1998 (Act 84 of 1998) provides for the protection of forests as well as specific tree species (as updated). Two species protected by the NFA (namely *Vachellia erioloba* and *Boscia albitrunca*) were identified during the Botanical Assessment. *A NFA permit as well as a NCNCA permit will be required should these plants need to be disturbed, removed or relocated.*

Species protected in terms of the **NCNCA (Northern Cape Nature Conservation Act, Act 9 of 2009)**: Five plant species, protected in terms of NCNCA, were encountered during the Botanical Assessment. A NCNCA flora permit application must be submitted should plant individuals need to be disturbed or relocated.

Table 9. Plant species protected in terms of the NCNCA encountered within the study area (see Botanical Assessment – Appendix D1).

NO.	SPECIES NAME	COMMENTS	RECOMMENDATIONS
1.	*Aizoon burchellii* **Schedule 2 protected**	Occasionally observed in deeper sandy areas.	Species protection through topsoil conservation.
2.	*Aloe claviflora* **Schedule 2 protected**	Very common in the north eastern part of the property.	Very common plant in this area. Protection through topsoil conservation.
3.	*Boscia albitrunca* **Schedule 2 protected**		
4.	*Cynanchum viminale* **Schedule 2 protected**	Occasionally observed within the footprint.	Larger *Cynanchum* plants are expected to transplant poorly. Species protection through topsoil conservation.
5.	*Euphorbia braunsii* **Schedule 2 protected**		**Search & rescue:** Occasionally observed. Individuals within footprint to be transplanted to surrounding area.

Alien Vegetation:

Portions of the site has been heavily invaded by the alien invasive *Prosopis* tree. These plants should be removed responsibly before development commence.

Aquatic ecosystems

No wetland is present within the proposed site for development however, a wetland (associated with the Orange River) is located within 500m of the proposed site for development (Figure 10). As per the Freshwater Assessment (Appendix D2), a drainage line is located adjacent to, and touches, the eastern/ southern boundaries of the proposed site, where a section of this drainage line is located within the proposed site for development (Figure 10; Appendix A). A section of a relatively small sub-catchment (approximately 192ha in extent, with a circumference of 5.8km) overlaps the portion of the proposed site for development. There will not be a need for the construction of a formalised storm water conduit.

The instream and riparian Present Ecological State (PES) of the drainage line were both classified as Class D, characterized as largely modified with a significant loss of natural habitat, biodiversity, and ecosystem functioning. The Ecological Importance (EI) of the drainage line (in close proximity to the site) is based on the presence of threatened fish species. As the non-perennial drainage line was dry at the time of the site visit, the EI could not be measured. No endangered fauna or flora were present along the drainage line. Fish species expected within the Lower Orange River, namely the *Labeobarbus kimberleyensis* (largemouth yellow-fish), the Orange River is classified as Ecologically Important (Category 4). Ecological Sensitivity (ES) refers to the ability of a particular watercourse to assimilate impacts and to what degree the assimilated impacts would change the nature of the watercourse (i.e. its sensitivity). The drainage line was considered Ecologically Sensitive however, the rehabilitation of the watercourse (back to its original, natural status) would take time due to site conditions (e.g. drought conditions) and pressure from human impacts. As no permanent water was present in the drainage line, biomonitoring was conducted on the lower Orange River (Appendix D2), where various points along the River were sampled. The closest sample site (namely the Grootdrink Bridge) was scored as Class D (characterized as fair as it has been impacted with some loss of ecological functioning).

The Orange River is protected from any contamination from the Gariep Township to a certain degree. The irrigation canal was constructed underneath the drainage line where stormwater flows within the drainage line. The stormwater will flow across the dirt road and into a cut-off trench, subsequently flowing into a concrete gulley and then the Orange River.

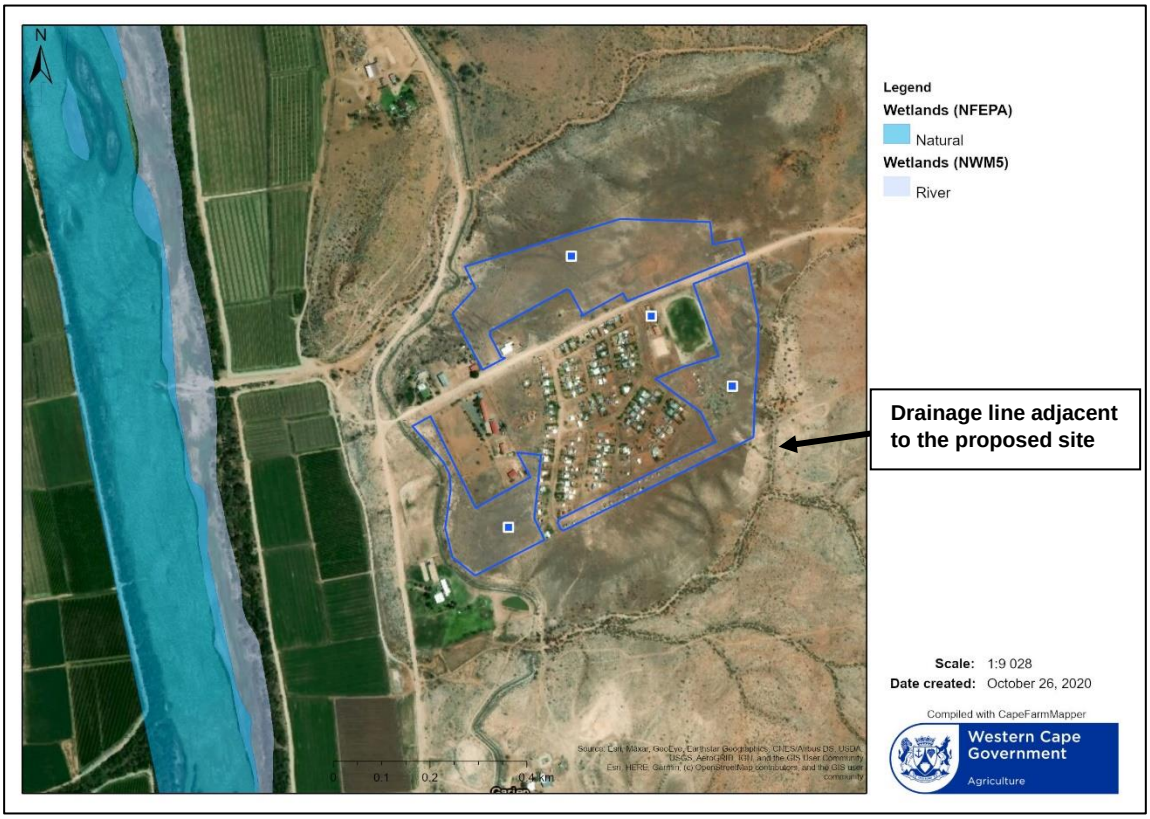

Figure 10. Wetland (associated with the Orange River) located within 500m of the proposed site for development (417m distance from proposed site for development).

SECTION C: PUBLIC PARTICIPATION

1) ADVERTISEMENT AND NOTICE

Publication name	**Kalahari Bulletin**	
Date published	**11th June 2020**	
Site notice position	**Latitude**	**Longitude**
Entrance to Gariep Township	28°36'47.59"S	21°46'41.44"E
Old Filling Station within the Gariep Township	28°36'43.39"S	21°46'47.39"E
Tuckshop/ Store at entrance	28°36'44.32"S	21°46'51.44"E
Entrance to Community Hall and Sporting Complex	28°36'42.13"S	21°46'57.89"E
Tuckshop/ Store with busy foot traffic	28°36'48.64"S	21°46'50.99"E
Southern Border of proposed site for development	28°36'55.38"S	21°46'51.14"E
!Kheis Local Municipality – Municipal Buildings	28°53'38.85"S	21°58'55.58"E
AgriMark – Groblershoop	28°53'17.84"S	21°58'45.62"E
Date placed	21st May 2020	

Include proof of the placement of the relevant advertisements and notices (Refer to Appendix E1).

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 733.

Initial PPP (Refer to Appendix E1)

- An advert was placed in the local newspaper (Kalahari Bulletin) which was published on the 11th June 2020 for a 60-day comment period[12]. Refer to App. E1.1.
- Posters were placed on the public notice boards of !Kheis Local Municipality, public notice board of AgriMark (Groblershoop), entrance to Gariep Township, old filling station within the Gariep Township, two tuckshops/ stores, entrance to the community hall/ sporting complex, and at the southern border of the proposed site for development (see Appendix E.1).
- Adjacent landowners/ occupiers were notified via letter drops.
- The landowner (!Kheis Local Municipality) was contacted to assist with identifying occupiers of land.
- An initial register of possible interested and affected parties was compiled (Refer to App. E2.1)
- Site visits were performed to notify relevant personnel as well as identify environmental sensitivities associated with the proposed site of development.
- A Comments and Response Report (C&R Report) was compiled to address comments raised during the initial stage of public participation (Refer to App E1.3).

[12] As per section 4 of the 'Directions Regarding Measures to Address, Prevent and Combat the Spread of COVID-19 Relating to National Environmental Management Permits and Licenses', published on the 5th June 2020 by the Department of Environment, Forestry and Fisheries (DEFF). These new directions state that any notice given after the 5th June 2020 requires an extended 30-day comment period in addition to the legislated 30-day comment period (total of 60-day comment period). If PP was conducted before the 27th March 2020, the formal comment period between 27th March and 5th June 2020 are null and void and therefore, restarted on the 6th June 2020. The initial comment period must be extended by additional 21 days (total of 51 day). Please note that we are still waiting for directives from DEFF on application timelines. These Directives published on the 5th June 2020 apply to Level 3 Lockdown Period and are subject to change. It must be noted that on the 17th August 2020, new Lockdown Regulations were published in terms of the DMA, which brought into effect Alert Level 2 with effect from 18 August 2020. The Directions of 5 June 2020, however, made it clear that in terms of the "*Commencement and duration", these Directions came "into effect on the date of publication in the Government Gazette, and will apply during Alert Level 3*." In other words, these Directions came into effect on 5 June 2020, but the duration of these Directions came to an end at midnight on the 17th August 2020 when Alert Level 3 came to an end.

Key stakeholders (other than organs of state) identified in terms of Regulation 41(2)(b) of GN 733

Title, Name and Surname	Affiliation/ key stakeholder status	Contact details (tel number or e-mail address)
!Kheis Local Municipality	Landowner	Tell: 054 833 9500 Fax: Email: fvaneck3@gmail.com
The Municipal Manager	ZF Mgcawu District Municipality	Tel: 054 461 6700 / 055 461 6700 Fax: 027 712 1635 Email: mm@kaigarib.gov.za / Tgalloway@zfm-dm.gov.za
Please refer to Appendix E2 and E4 for the Register of I&AP's		

Include proof that the key stakeholder received written notification of the proposed activities (Appendix E2). 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.

3) ISSUES RAISED BY INTERESTED AND AFFECTED PARTIES (Please See Appendix E3)

Summary of main issues raised by I&APs	Summary of response from EAP
Date: 17/06/2020 / **I&AP:** Gariep Watch (Chairman: Mr Ferdie Botha/ Technical Advisor: Mr Fritz Bekker) Previous watercourse monitoring and water quality analysis has suggested that sewage is being discharged into the Orange River at different locations along the length of the watercourse. Previous site visits to various existing !Kheis townships show that sewerage infrastructure is not adequately maintained and/or used for its intended purpose. Sewerage treatment works, as well as associated infrastructure (e.g. oxidation ponds), are not adequately functioning, where raw sewage is disposed of into the veld and/or watercourses. Therefore, concerns associated with the proposed development include the increased pollution of the downstream environment due to a lack of functioning sewerage treatment works. Therefore, Gariep Watch object to the proposed development.	Noted, issues relating to the water quality and sewage infrastructure have been addressed in this Draft BAR, EMPr, Engineer's Services Report (Appendix D5), and Specialist Reports (Appendix D1 and D2). As per the Engineer's Services Report, all existing households within the Gariep Settlement are currently serviced by Ventilated Improved Pit (VIP) toilets as no bulk sewer infrastructure is present. The construction of a full-borne sewerage system was recommended as per the specifications outlined in the Engineer's Services Report. As per the Botanical Assessment (Appendix D1), - the Municipality must ensure that adequate waste and sewerage facilities and or services are established to service this community.
Date: 29/06/2020 / **I&AP:** Boegoeberg Watergebruikersvereniging (Jean Lombard) Boegoeberg Water Users Association comments are regarding the Boegoeberg Canal System which is used for raw water distribution. Although maintenance is regularly done, the lifespan of the water system has been exceeded. This posses a risk to the surrounding areas due to any potential unplanned canal breakage resulting in the outflow of approximately $3m^3/s$ from the Gariep Canal into the surrounding environment. Other concerns raised include water seepage, health and safety (potential drownings), litter and pollution of raw water within the canal.	Noted, pollution was identified as a potential impact. Appropriate mitigation measures have been included in the Impact Assessment and EMPr. Measures for the proposed mitigation of these identified impacts have been stipulated in the impact assessment (Appendix F). This includes implementing effective waste management measures to reduce / prevent illegal dumping and/ or contaminated water entering the canal. Moreover, as per the Freshwater Assessment, a structure was present which prevented stormwater entering the irrigation tunnel (Figure 14 of Freshwater Assessment). Fences surrounding the Irrigation Tunnel must be maintained. See Appendix E3 for more information.

Recommendations included taking these risks into account to minimize these risks which includes not allowing any structure within proximity to the Gariep Canal.	Noted, thank you. The preferred layout has considered environmental and socially sensitive areas for the proposed site for development. The northern section of Site I (please refer to Figure 1 of the DBAR) will not be earmarked for residential zoning (Appendix C) and mitigation measures as per Appendix F (Impact No. 19) must be implemented.

4) COMMENTS AND RESPONSE REPORT

The practitioner must record all comments received from I&APs and respond to each comment before the Draft BAR 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 E3.

Please refer to Appendix E3 for the comments and response report.

5) AUTHORITY PARTICIPATION

Authorities and organs of state identified as key stakeholders:

Authority/Organ of State	Contact person (Title, Name and Surname)	Tel No	Fax No	e-mail	Postal address
Please refer to Appendix E2 & E4					

Include proof that the Authorities and Organs of State received written notification of the proposed activities as appendix E4.

In the case of renewable energy projects, Eskom and the SKA Project Office must be included in the list of Organs of State.

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 E5.

Copies of any correspondence and minutes of any meetings held must be included in Appendix E6.

SECTION D: IMPACT ASSESSMENT

The assessment of impacts must adhere to the minimum requirements in the EIA Regulations, 2014 and should take applicable official guidelines into account. The issues raised by interested and affected parties should also be addressed in the assessment of impacts.

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

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, including impacts relating to the choice of site/activity/technology alternatives as well as the mitigation measures that may eliminate or reduce the potential impacts listed. This impact assessment must be applied to all the identified alternatives to the activities identified in Section A(2) of this report.

Please see Appendix F for Impact Assessment and Scoring Matrix.

Activity	Impact summary	Significance	Proposed mitigation
Alternative 1 (preferred alternative)			
Geographical and physical	***Direct impacts:***	Medium/ Low	- Implement EMP; - Minimise footprint; - ECO monitoring; - Waste management. **Please refer to Appendix F for full impact assessment.**
	Indirect impacts:	Low	
	Cumulative impacts: *After mitigation*	Low	
Biological: *(vegetation, protected species, CBA's, watercourse impacts)*	***Direct impacts:***	Medium/low	- All construction must be done in accordance with an approved construction and operational phase Environmental Management Plan (EMP), which must include the recommendations made in this report. - A suitably qualified Environmental Control Officer must be appointed to monitor the construction phase in terms of the EMP and any other conditions pertaining to specialist studies. **- Before any work is done** protected tree species must be marked and demarcated (Refer to Table 2 of Appendix D1). **- Before any work is done** search & rescue as discussed in Table 3 must be completed. - Lay-down areas or construction sites must be located within the construction footprint. - No clearing of any area outside of the construction footprint may be allowed. - All waste that had been illegally dumped within the footprint must be removed to a Municipal approved waste disposal site. - An integrated waste management approach must be implemented during construction. Construction related general and hazardous waste may only be disposed of at Municipal approved waste disposal sites. Alien invasive *Prosopis* plants within the footprint (and immediate surroundings) must be removed in a responsible way (to ensure against regrowth).
	Indirect impacts:	Low	
	Cumulative impacts: *After mitigation*	Low negative	

Activity	Impact summary	Significance	Proposed mitigation
Alternative 1 (preferred alternative)			
			- The Municipality must ensure that adequate waste and sewerage facilities and or services are established to service this community. **Please refer to Appendix F for full impact assessment.**
Sewage Management	***Direct impacts:***	High	All existing households within the Gariep Settlement are serviced by Ventilated Improved Pit (VIP) toilets as no bulk sewer infrastructure is present. As per the Engineer's Services Report, a full-borne sewerage system is recommended. As per the Botanical Assessment (Appendix D1), the Municipality must ensure that adequate waste and sewerage facilities and or services are established to service this community.
	Indirect impacts:	High	
	Cumulative impacts: *After mitigation*	Low	
Watercourse	***Direct impacts:***	Low	A drainage line is located adjacent to the eastern and southern boundary of the proposed site for development. A small section of this drainage line is located within the proposed site of development. The Present Ecological State (PES) of the drainage line was classified as Class D, characterized as largely modified with a significant loss of natural habitat, biodiversity, and ecosystem functioning. The Ecological Importance (EI) of the drainage line (in close proximity to the site) is based on the presence of threatened fish species. As the non-perennial drainage line was dry at the time of the site visit, the EI could not be measured. No endangered fauna or flora were present along the drainage line. A buffer zone of at least 20m wide should be maintained from the drainage line. No stockpiling of material is permitted within 20m of the drainage line.
	Indirect impacts:	Low	
	Cumulative impacts: *After mitigation*	Low	
Socio-economic	***Direct impacts:***	Medium/low	The construction of Gariep Housing Project will create employment and skills development opportunities during the construction phase. This will upskill local community members and lowering the high unemployment rate within the !Kheis LM and more specifically, the Gariep Township. Appoint a local representative to assist with the sourcing and appointment of suitable local people, wherever possible during the construction and operational phase. Although the irrigation canal has been fenced, the following mitigation measures must be implemented: - Should any section of the fence be damaged during construction, the fence must be immediately repaired; - Barriers, controlling community members' access to the irrigation canal, must be installed if no fence is present; - Guidelines stipulated in the World Health Organization's report, entitled Preventing drowning: an implementation guide, must be consulted to ensure that all applicable mitigation measures are implemented. A copy of this report can be obtained from the ECO or using the following link: file:///C:/Users/Anthony/Downloads/9789241511933-eng.pdf. - Notice boards must be erected on the fence line warning community members of the potential dangers and that accessing the irrigation canal is strictly prohibited. Information stipulated on the board must be in both English and Afrikaans. **Please refer to Appendix F for full impact assessment.**
	Indirect impacts:	Medium	
	Cumulative impacts: *After mitigation*	Low (positive)	
	Direct impacts:	N/A	

Activity	Impact summary	Significance	Proposed mitigation
Alternative 1 (preferred alternative)			
Cultural Historical			No significant heritage sites or features were identified within the proposed site for development. Refer to Heritage impact recommendations under Section D3. **Please refer to Appendix F for full impact assessment.**
	Indirect impacts:	N/A	
	Cumulative impacts: *After mitigation*	N/A	
Noise impact	***Direct impacts:***	Low	Any noise generated by construction activities will be a temporary impact however, the following mitigation measures will be implemented: - A complaints register must be maintained on-site. Any complaints received must be responded to and rectified accordingly. The ECO must be notified of any complaints; - All construction vehicles must be fitted with standard silencers. All silencers must be maintained. All machinery used on site must have suppressors. Working hours must be limited to and strictly adhered to standard daylight working hours (08h00-17h00). **Please refer to Appendix F for full impact assessment.**
	Indirect impacts:	Low	
	Cumulative impacts: *After mitigation*	Low	
Visual impact	***Direct impacts:***	Low	The extent of the property will not be visible to commuters utilizing the N10 (located 2km west of the site, across the Orange River) or other communities/ townships (e.g. the nearest community, Grootdrink, is located 5.72km north west of the proposed site). **Please refer to Appendix F for full impact assessment.**
	Indirect impacts:	Low	
	Cumulative impacts: *After mitigation*	Low negative	
No-go option			
The "No-Go" option: Potential impact associated with the No-Go alternative.	***Direct impacts:***	Low/ Medium	The vegetation present on site will remain as is. The presence of alien invasive plant species must be managed in accordance with due diligence. Please refer to mitigation measures to be implemented for Impact No. 7 as these mitigation measures must be implemented for this impact. **Please refer to Appendix F for full impact assessment.**
	Indirect impacts:	Low	
	Cumulative impacts: *After mitigation*	Low	

A complete impact assessment in terms of Regulation 19(3) of GN 733 must be included as Appendix F.

2) 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.

Please refer to Appendix F for full Impact Assessment and proposed Mitigation Measures.

Gariep Housing

There are no logical site or layout alternatives, which will either reduce construction, maintenance, or operational costs.

The most significant impacts associated with the proposed project are:

- **Transformation of vegetation within a Critical Biodiversity Area:** Of the 15ha footprint, approximately 4.16ha are already disturbed or transformed (settled). The remainder of the site supported a very dry and reduced vegetation layer. Vegetation associated with the Site I includes natural veld in relative good condition whereas Sites II and III are disturbed / transformed with a very sparse vegetation layer (Figure 1). The most significant botanical aspect of this site is the presence of a four (4) protected Camel Thorn (*Vachellia erioloba*) trees and a number of protected Sheppard trees (*Boscia albitrunca*) and a number of Northern Cape Nature Conservation Act, protected species. According to the impact assessment, the development is likely to result in a Medium - Low impact, which can be reduced to a Low impact with good environmental control during construction. With the correct mitigation it is **unlikely** that the development will contribute significantly to any of the following:
  - Significant loss of vegetation type and associated habitat.
  - Loss of ecological processes (e.g. migration patterns, pollinators, river function etc.) due to construction and operational activities.
  - Loss of local biodiversity and threatened plant species.
  - Loss of ecosystem connectivity.

Therefore, the botanical specialist recommended that, with the available information, the project be approved with the proposed mitigation actions.

- **Contamination of nearby watercourses with sewage (due to current sewage disposal method, namely the Ventilated Improved Pit (VIP) toilets as no bulk sewer infrastructure is present) and solid waste:** As per the Engineer's Service Report, a full-borne sewerage system is recommended. As per the Botanical Assessment (Appendix D1), the Municipality must ensure that adequate waste and sewerage facilities and or services are established to service this community. The implementation of adequate waste and sewerage facilities will reduce the likelihood of sewage infrastructural failures resulting in the discharge of sewage into the environment;

- **Health and Safety associated with the irrigation canal (i.e. swimming, injury, and potential for drowning);** Although the irrigation canal has been fenced, the following mitigation measures must be implemented:
  - Should any section of the fence be damaged during construction, the fence must be immediately repaired;
  - Barriers, controlling community members' access to the irrigation canal, must be installed if no fence is present;
  - Guidelines stipulated in the World Health Organization's report, entitled Preventing drowning: an implementation guide, must be consulted to ensure that all applicable mitigation measures are implemented. A copy of this report can be obtained from the ECO or using the following link: file:///C:/Users/Anthony/Downloads/9789241511933-eng.pdf.
  - Notice boards must be erected on the fence line warning community members of the potential dangers and that accessing the irrigation canal is strictly prohibited. Information stipulated on the board must be in both English and Afrikaans.
  - Biodiversity relative to protected NFA and NCNCA plant species present within the development footprint:

- **Soil erosion associated with exposing large areas of soil to erosion**: as per Appendix F, appropriate mitigation measures will limit the exposure of large areas of soil susceptible to erosion. This will prevent the sedimentation of nearby watercourses as well as dust generation.

- **Impact on nearby watercourse**: As per Appendix F, appropriate mitigation measures will limit the impact of construction and operational activities on this drainage line. The presence of a drainage line adjacent to the development footprint. The section of the drainage line, is present within the site for development, and must be demarcated as a no-go zone. As per

the Botanical Assessment (Appendix D1), the Municipality must ensure that adequate waste and sewerage facilities and or services are established to service this community. This will prevent waste entering the drainage line.

No-go alternative (compulsory)

It is very important to note that the "No-Go Alternative" will not result in a status quo or no impact. The existing infrastructure will remain under pressure (struggling to meet current demands) and is likely to prohibit/restrict future development in this area.

The no-go alternative will also NOT mean that many of the impacts associated with the expansion WILL NOT occur. Currently, new informal settling has taken place and continues to take place. This directly affects the services provided to the existing township as well as the receiving environment The no-go alternative will also NOT mean that many of the impacts associated with the expansion WILL NOT occur. This would mean that no-development would take place and the proposed site will remain as is. No new, negative environmental impact(s) will take place however, current illegal dumping of general and hazardous waste will continue to take place. As no bulk sewer infrastructure is present, the community will continue using Ventilated Improved Pit (VIP) toilets which may result in the contamination of the receiving environment. The no-go alternative will impede socioeconomic development in the area as no short- and long-term employment and skills-development opportunities will be created relative to this proposed development. As per the Botanical Assessment, the No-Go option is not likely to result in a "no-impact" scenario, as constant slow degradation is expected to continue as a result of urban activities and poor management of the site.

Gariep Housing Alternatives

SITE ALTERNATIVE

No feasible alternative sites were considered due to:

1. **Location of the proposed site**: the proposed site for development is located adjacent to the existing Gariep township and thus, the existing land use is in line with the proposed activities of the development. The area surrounding the existing township is highly disturbed due to illegal dumping as well as tree harvesting for firewood.
2. **Proximity to watercourses**: as identified by the Freshwater Specialist, a watercourse of importance is located adjacent to, and touches, the eastern and southern boundaries of the proposed development footprint. . Thus, a section of the drainage line is located within the proposed site for development (Appendix A). Moreover, a drainage line is located ~200m south and the Orange River is located ~480m west of the proposed site for development. It must be noted that the irrigation canal is located ~20m north west and west of the site boundary.
3. **Use of existing services**: the construction of the proposed development surrounding the existing Gariep township will enable construction activities to utilize existing services (namely existing roads) to access the site. This will reduce the need to construct new access roads and therefore, the unnecessary clearance of vegetation. The proposed site is located adjacent to the existing residential area of Gariep. As stated above, this would provide accessibility and allow the proposed development to link to the existing services infrastructure.
4. **Previously earmarked for development**: the proposed site for development was previously earmarked as suitable land for housing development (as stipulated in the !Kheis Local Municipality Land Development Plan/ Rural Spatial Development Framework, 2014).
5. **Ownership**: No other site alternatives were considered. The site is owned by the Applicant, and within the urban edge, and is therefore considered the only reasonable and feasible site

LAYOUT ALTERNATIVES

Alternative 1

Alternative 1 (Appendix C) is the first of three (3) concept layouts initially proposed. The layout included 135 erven with an extent of approximately 15ha, which included;
- Residential Zone I – 135 land units (namely sub-economic households) is proposed;
- Undetermined Zone – one (1) land unit;
- Open Space Zone I – one (1) land unit;

This alternative was considered a viable option as it provides an adequate number of housing opportunities as per the Needs and Desirability Report (Appendix D6). No erven have been considered in the northern section of the proposed development. Stormwater run-off can be channelled by the proposed road networks. The road network comprises of narrow roads, due to the existing position of residential structures. Moreover, due to existing services and infrastructure, as well as identified environmental sensitive areas, this layout needed to be amendment (see Alternative below).

Alternative 2

Alternative 2 (Appendix C) is the second of three (3) concept layouts initially proposed. The layout included 135 erven with an extent of approximately 15ha, which includes;
- Residential Zone I – 135 land units (namely sub-economic households) is proposed;
- Open Space Zone II – two (2) land units; and
- Business Zone IV – one (1) unit.

This alternative differs from Alternative 1 (i.e. preferred layout) via replacement of a portion of the northern section with sub-economic households. No erven have been considered in the northern section of the proposed development. Stormwater run-off can be channelled by the proposed road networks. The road network comprises of narrow roads, due to the existing position of residential structures. Moreover, due to existing services and infrastructure, as well as identified environmental sensitive areas, this layout needed to be amendment (see Alternative below).

Alternative 3

Alternative 3 (Appendix C) was the final layout proposed and is the Applicant's Preferred Layout. This layout includes 135 erven, over approximately 15ha extent and includes;

- Residential Zone I – 135 land units (namely sub-economic households) is proposed. Primary Use: Dwelling House;
- Open Space Zone II – eight (8) land units. Where open space refers to land set aside or to be set aside for the use by a community as a recreation area;
- Institutional Zone II – two (2) land units;
- Authority Zone II – two (2) land units which will be established in accordance with the requirements of the Guidelines for Human Settlement Planning and Design;
- Business Zone 1 – three (3) land unit. Primary Use: Hotels, guest houses, places of refreshment, shops, business premises, dwelling units, residential building, place of amusement, places of worship including funeral parlours with chapels, places of instruction, dry cleaners, public garages, parking, car wash, social halls.

This alternative was considered a viable option as it provides an adequate number of housing opportunities as per the Needs and Desirability Report (Appendix D6). No erven have been considered in the eastern section of the proposed development (i.e. in close proximity to the drainage line present on site). Stormwater run-off can be channelled by the proposed road networks. The road network comprises of narrow roads, due to the existing position of residential structures. This layout has incorporated environmentally sensitive areas as well as future access to services. Therefore, this layout was the preferred layout.

No-go alternative (compulsory)

It is very important to note that the “No-Go Alternative” will not result in a status quo or no impact. The existing infrastructure will remain under pressure (struggling to meet current demands) and is likely to prohibit/restrict future development in this area.

The no-go alternative will also NOT mean that many of the impacts associated with the expansion WILL NOT occur. Currently, new informal settling has taken place and continues to take place. This directly affects the services provided to the existing township as well as the receiving environment The no-go alternative will also NOT mean that many of the impacts associated with the expansion WILL NOT occur. This would mean that no-development would take place and the proposed site will remain as is. No new, negative environmental impact(s) will take place however, current illegal dumping of general and hazardous waste will continue to take place. As no bulk sewer infrastructure is present, the community will continue using Ventilated Improved Pit (VIP) toilets which may result in the contamination of the receiving environment. The no-go alternative will impede socioeconomic development in the area as no short- and long-term employment and skills-development opportunities will be created relative to this proposed development. As per the Botanical Assessment, the No-Go option is not likely to result in a “no-impact” scenario, as constant slow degradation is expected to continue as a result of urban activities and poor management of the site.

SECTION E. RECOMMENDATION OF PRACTITIONER

Is the information contained in this report and the documentation attached hereto sufficient to make a decision in respect of the activity applied for (in the view of the environmental assessment practitioner)?	**YES**	~~NO~~

If "NO", indicate the aspects that should be assessed further as part of a Scoping and EIA process before a decision can be made (list the aspects that require further assessment).

N/A

If "YES", please list any recommended conditions, including mitigation measures that should be considered for inclusion in any authorisation that may be granted by the competent authority in respect of the application.

Recommended conditions

- All construction must be done in accordance with an approved construction and operational phase Environmental Management Plan (EMP), which must be developed by a suitably experienced Environmental Assessment Practitioner.
- A suitably experienced ECO must be appointed to ensure compliance with environmental conditions of the Environmental Authorization.
- Application for a flora permit must be made in terms of the NCNCA (with regards to protected species listed in Schedule 1 and 2 of the act) as well as the NFA.
- Access should be limited to existing routes and any additional temporary access routes must be approved by the ECO and rehabilitated on completion.
- When working near urban areas, construction should adhere to during reasonable working hours in order to minimise noise nuisance.
- All significant biodiversity features, such as protected plant species and location of the drainage line adjacent to and the section within the proposed site for development (eastern section of the development footprint), must be identified and mapped on the site plans. The section of the drainage line, located within the proposed site for development (Appendix A), must be demarcated as a No-Go area. Special care must be taken when working in any of these areas.
- Before any work is done the construction footprint must be clearly demarcated (with the aim at minimal width/smallest footprint). The demarcation must include the total footprint necessary to execute the work, but must aim at minimum disturbance.
- Lay-down areas or construction sites must be located within already disturbed areas or areas of low ecological value and must be pre-approved by the ECO.
- Indiscriminate clearing of areas must be avoided.
- No stockpiling of material is permitted within 32m of any watercourse;
- If any evidence of archaeological sites or remains (e.g. remnants of stone-made structures, indigenous ceramics, bones, stone artefacts, ostrich eggshell fragments, charcoal and ash concentrations), fossils or other categories of heritage resources are found during the proposed development, SAHRA APM Unit (Natasha Higgitt/John Gribble 021 462 5402) must be alerted. If unmarked human burials are uncovered, the SAHRA Burial Grounds and Graves (BGG) Unit (Itumeleng Masiteng/Mimi Seetelo 012 320 8490), must be alerted immediately. A professional archaeologist or palaeontologist, depending on the nature of the finds, must be contracted as soon as possible to inspect the findings. If the newly discovered heritage resources prove to be of archaeological or palaeontological significance, a Phase 2 rescue operation may be required.
- All watercourses and stream must be classified as significant environmental features. Adequate measures must be implemented to ensure against erosion.
- All alien vegetation must be removed from within the construction footprint (the road reserve) and immediate surroundings
    - It is imperative that the correct alien eradication methods are employed (especially with regards to *Prosopis* control) as incorrect methods **WILL** aggravate the infestation;
    - Follow up work must be carried out after rehabilitation to ensure that no invasive alien plant re-establishes itself.

• All construction areas must be suitably rehabilitated on completion of the project. ○ This includes the removal of all excavated material, spoil and rocks, all construction related material and all waste material. This also includes replacing the topsoil back on top of the excavation as well as shaping the area to represent the original shape of the environment (where applicable). • The presence of waste material on site must be addressed, namely removed from site and disposed of at a registered disposal facility. • As per the recommendations made by the Botanical Specialist (Appendix D1), Freshwater Specialist (Appendix D2), and as per the Engineers Service Report (Appendix D4), it is recommended that an adequate waste and sewage facilities and / or services be established to service the proposed Gariep Township (as specified in the Engineer's Service Report, and should be made a condition of the Environmental Authorisation (EA).		
Is an EMPr attached?	YES	NO

The EMPr must be attached as Appendix G.

The details of the EAP who compiled the BAR and the expertise of the EAP to perform the Basic Assessment process must be included as Appendix H.

If any specialist reports were used during the compilation of this BAR, please attach the declaration of interest for each specialist in Appendix I.

Any other information relevant to this application and not previously included must be attached in Appendix J.

_____

NAME OF EAP

_____ _____

SIGNATURE OF EAP DATE

SECTION F: APPENDIXES

The following appendixes are attached:

APPENDIX A: MAPS

APPENDIX B: SITE PHOTOGRAPHS

APPENDIX C: FACILITY ILLUSTRATION

APPENDIX D: SPECIALIST REPORTS

APPENDIX D1: BOTANICAL IMPACT ASSESSMENT

APPENDIX D2: FRESHWATER IMPACT ASSESSMENT

APPENDIX D3: HERITAGE IMPACT ASSESSMENT

APPENDIX D4: GEOTECHNICAL INVESTIGATION

APPENDIX D5: ENGINEER'S SERVICES REPORT

APPENDIX D6: NEEDS AND DESIRIBILITY

APPENDIX E: PUBLIC PARTICIPATION

APPENDIX E1:PROOF OF ADVERTISEMENT AND NOTICES

APPENDIX E2:COMMENTS AND RESPONSES

APPENDIX E3:I&AP REGISTER

APPENDIX F: IMPACT ASSESSMENT AND SCORING MATRIX

APPENDIX G: ENVIRONMENTAL MANAGEMENT PLAN (EMP)

APPENDIX H: DETAILS OF EAP AND EXPERTISE