EnviroAfrica
Environmental Management and Impact Assessment
Omgewingsbestuur en Impakbeoordeling

THE PROPOSED

HENKRIES MEGA-AGRIPARK DEVELOPMENT

Remainder of the Farm Steinkopf No. 22, Springbok
Nama Khoi Municipality, Northern Cape Province.

ENVIRONMENTAL IMPACT ASSESSMENT REPORT FOR COMMENT

June 2017

DEA Ref. No.: NC/BA/28/NAM/NAM/STE1/2016

P.O.Box 5367
HELDERBERG 7135
Tel: (021) 851 1616
Fax: (086) 512 0154
e-mail: admin@enviroafrica.co.za
Unit 7, Pastorie Park
Somerset West
CK 97/46008/23
VAT4870170513

DETAILS OF THE APPLICANT:

The Department of Agriculture, Land Reform and Rural Development

***Contact*:** **Mr. Breyton Saal**

Physical: **Hospital Street**
Springbok,

Postal: **P.O. Box 468**
Springbok
8240

Tel: **027 712 1315**
Fax: **027 712 2270**

Email: **bsaal@ncpg.gov.za**

DETAILS OF THE EAP

EAP: Inge Erasmus (BA Hons) under supervision of Mr. P.J.J. Botes (Pri. Sci. Nat.)

Company: **EnviroAfrica CC**
Physical: Unit 7, Pastorie Park
Reitz Street
Somerset West.
Postal: PO Box 5367
Helderberg, 7135

Tell: 021 – 851 1616
Fax: 086 – 512 0154
Email: inge@enviroafrica.co.za or peet@enviroafrica.co.za

EAP qualifications	**Inge Erasmus:** BA (Hons) Geography and Environmental Studies (University of Stellenbosch, 2 years experience **P.J.J. Botes:** BSc; BSc (Hons) Botany/Plant Ecology (University of Stellenbosch), >15 years' experience.
EAP registrations	Registered Professional Botanical, Environmental and Ecological Scientists at SACNASP (South African Council for Natural Scientific Professions).
EAP expertise	Please refer to Appendix 8 in this report

TABLE OF CONTENTS

FIGURES

ABBREVIATIONS

BGIS	Biodiversity Geographic Information System
CBA	Critical Biodiversity Area
DEA	Department of Environmental Affairs
DENC	Department of Environment and Nature Conservation
DWS	Department of Water and Sanitation
EAP	Environmental Assessment Practitioner
ECA	Environment Conservation Act (Act No. 73 of 1989)
EIA	Environmental Impact Assessment
EIR	Environmental Impact Report
EMP	Environmental Management Programme
HIA	Heritage Impact Assessment
HWC	Heritage Western Cape
I&APs	Interested and Affected Parties
NEMA	National Environmental Management Act (Act No. 107 of 1998)
NEM: BA	National Environmental Management: Biodiversity Act (Act No. 10 of 2004)
NHRA	National Heritage Resources Act (Act No. 25 of 1999)
NID	Notice of Intent to Develop
NWA	National Water Act
OESA	Other Ecological Support Area
SAHRA	South African Heritage Resources Agency
SANBI	South African National Biodiversity Institute
WULA	Water Use Licence Application

1. INTRODUCTION

Henkries Farm is situated along the bank of the Orange River, approximately 90 km north of Springbok, just west of Goodhouse, Northern Cape Province. Derived from Khoekhoen, the name, also encountered as Henkrees, Henkeriss and Hamneries, means *'mountain slope'* (www/en.wikkepedia.org). Henkries, which falls within the Namaqualand District Municipality, relies almost exclusively on agriculture irrigated with water extracted from the Orange River. Namaqualand is an arid to semi-arid area situated in the northwest corner of South Africa, bordering on the Orange River. Large areas of arable soil can be found on the banks of the Orange River and the proximity to irrigation water creates attractive opportunities for development of intensive agricultural development. Namakwa district is one of very few areas in South Africa where high quality arable land together with water licenses from the Orange River are still readily available for the economic development of local communities. Agricultural development has the potential to unlock the economy of this region through high value crop agriculture.

The Northern Cape Department of Agriculture Land Reform and Rural Development (henceforward referred to as the Department of Agriculture or DoA) proposes the establishment of a Mega-Agripark at Henkries in order to stimulate the economy of this region, through agriculture, in order to promote sustainable economic growth, job creation and economic empowerment of this community (Draft Henkries Development Plan, 31July 2015). The proposed Henkries development forms part of the Orange River Emerging Farmer Settlement and Development Program which centres on economic growth, the development of rural communities and economic empowerment through the development of irrigation land into intensive agricultural production units in the Northern Cape.

The scope of the Henkries project will be to develop approximately 130-150 ha of high potential arable land near Henkries. This development is designed to act as catalyst for the development of a further 3 000 ha of arable land which is located in eleven distinct areas of the Namaqualand District. The basket of products to be produced varies from cash crops such as lucerne and grains, but the bulk of the development is aimed at high value crops with export potential in order to secure significant growth on the required investment. These products will be marketed through a central distribution center and processing facility earmarked to be developed in the Springbok Industrial Zone.

The proposed development will also include the development of two reservoirs and connecting pipelines to the existing agricultural use pump station at Henkries.

1.1. BACKGROUND

Henkries Farm is well known for its date production. Over and above the approximately 60ha of dates for commercial markets, cash crops and vegetables are produced under pivot irrigation on approximately 25 ha. The existing agricultural development at Henkries focuses on economic growth, job creation and economic empowerment, through the production of dates, dry grapes (raisins) and mango's under irrigation.

The scope of this project is to expand the production of dates and dry grapes (raisins) under irrigation. The Department of Agriculture, Land Reform and Rural Development took over management of Henkries Farm from CASIDRA on 1 June 2008. Henkries farm worker component currently consists out of 14 permanent workers and 8 seasonal workers, but it also appoints an additional 20 worker during the dates and mango harvesting period. Manual labor is used to execute almost all activities on the farm. The Henkries farm workers originate from Steinkopf, Goodhouse and unemployed persons of the surrounding areas.

1.1.1. The applicant

The applicant is the Department of Agriculture, Land Reform and Rural Development.

EnviroAfrica CC has been appointed as the independent environmental assessment practitioner (EAP) responsible for undertaking the relevant EIA and the Public Participation Process required in terms of the National Environmental Management Act (Act 107 of 1998) (NEMA). This report forms part of the EIA process.

The aim of this report is:

- to describe the proposed project and its associated activities;
- the EIA process followed to date;
- to present alternatives; and
- to list issues identified for further study; and
- assess the potential impacts on strength of specialist inputs.

The recommended specialist studies (Section 8) were undertaken and potentially significant issues (Section 6) was investigated and assessed.

1.2. THE PROPOSED ACTIVITY

The NC Department of Agriculture Land Reform and Rural Development proposes the establishment of a Mega-Agripark at Henkries in order to stimulate the economy of this region, through agriculture (Henkries Development Plan, 31July 2015, Appendix 4). The proposed Henkries development forms part of the Orange River Emerging Farmer Settlement and Development Program which centres on economic growth, the development of rural communities

and economic empowerment through the development of irrigation land into intensive agricultural production units in the Northern Cape.

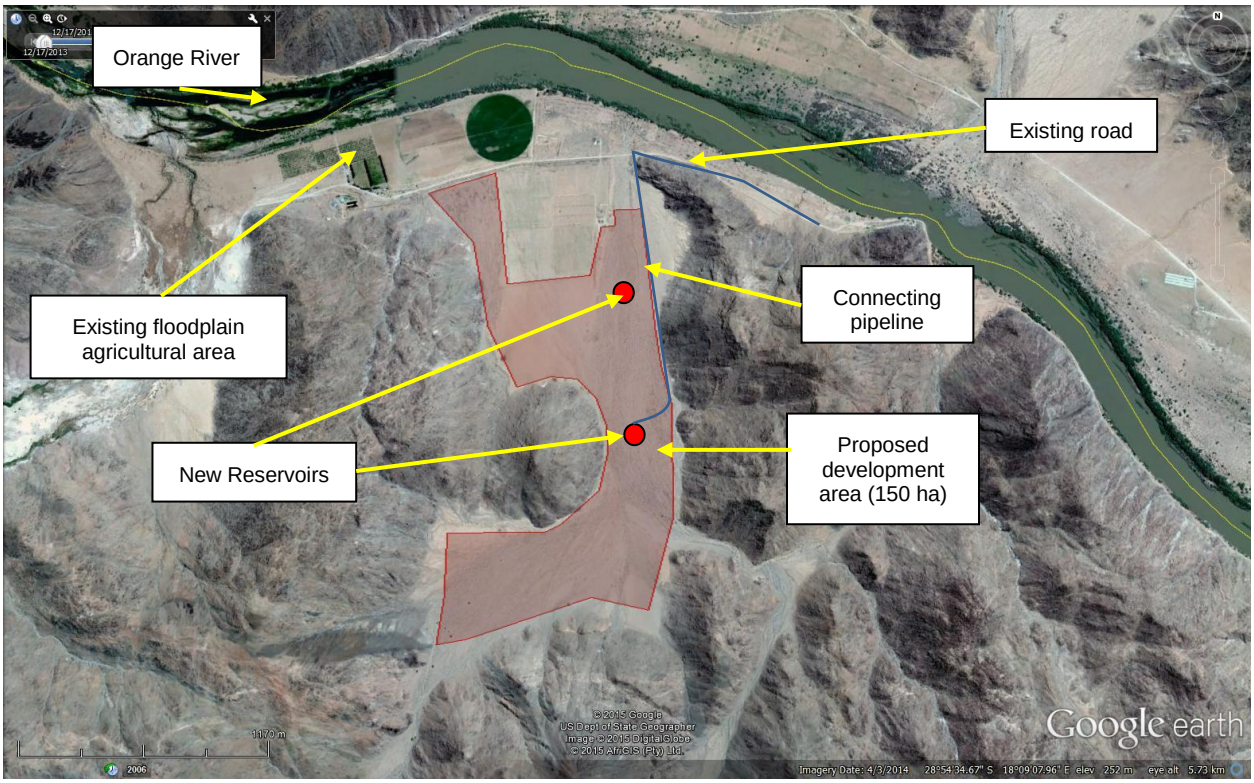

Figure 1: Proposed development area

1.2.1. Project scope

The proposed scope of the Henkries project will be:

- to develop a further 130 - 150 ha of agricultural land near Henkries (an additional 40 ha of existing agricultural land will also be re-vitalised – not part of this application):
- construct 2 new reservoirs for irrigation purposes with capacities as follows;
  - 6 690 m^3 and
  - 21 120 m^3 respectively;
- construct two connecting pipelines to these reservoirs with dimensions as follows:
  - a 2.014 km long, 0.35 Ø, 72.7778 l/s connecting the smaller reservoir; and
  - a 3.042 km long, 0.5 Ø, 244.444 l/s pipeline connecting the larger reservoir.

This development is designed to act as catalyst for the development of a further 3 000 ha of arable land which is located in eleven distinct areas of the Namaqualand District. The bulk of products to be produced aim at high value crops with export potential in order to secure significant growth on the required investment. These products will be marketed through a central distribution center and processing facility earmarked to be developed in the Springbok Industrial Zone. (Please refer to **Appendix 2** for the Site Plan).

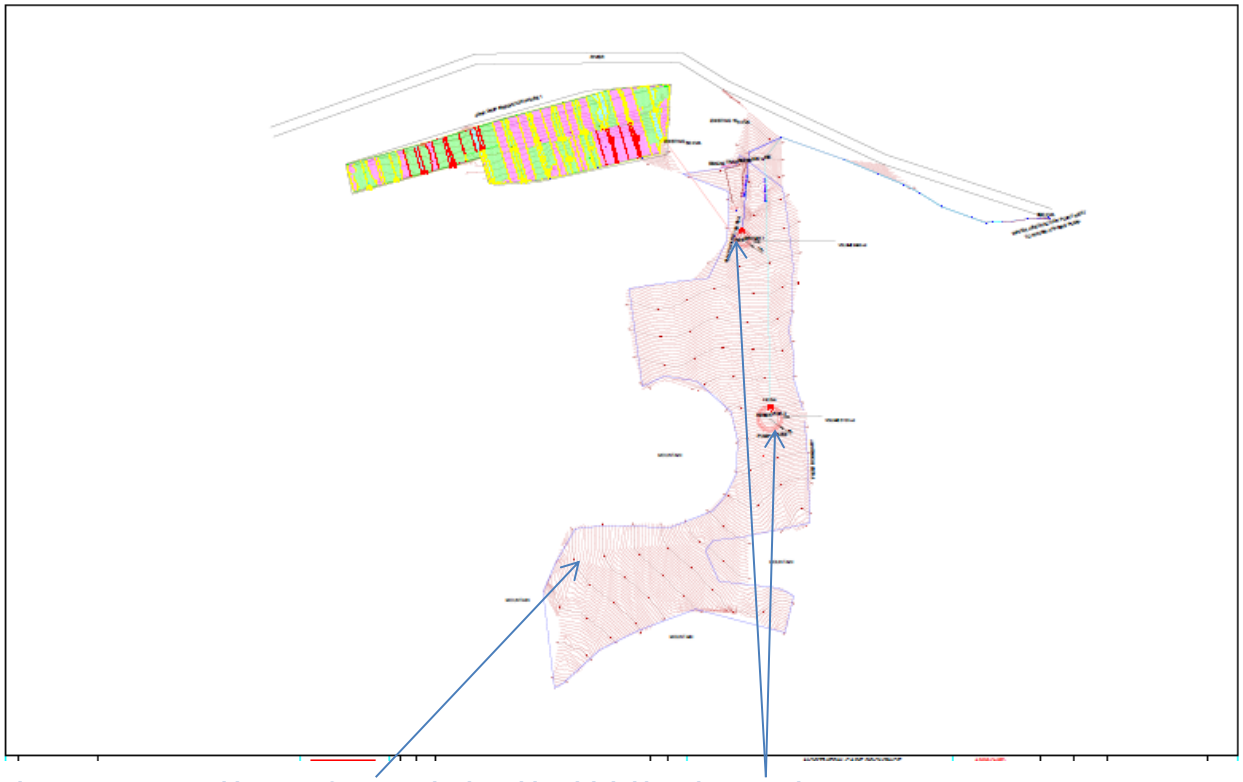

Figure 2: Proposed layout of new agricultural land (pink) and reservoirs

Access to the site will be directly off the existing Henkries / Goodhouse connection road, which borders the southern section of the proposed development.

1.3. NEED AND DESIRABILITY

In terms of the National Environmental Management Act, as amended, EIA 2010 regulations the Scoping/EIA report must provide a description of the need and desirability of the proposed activity. The consideration of "need and desirability" in EIA decision-making requires the consideration of the strategic context of the development proposal along with the broader societal needs and the public interest.

While the concept of need and desirability relates to the *type* of development being proposed, essentially, the concept of need and desirability can be explained in terms of the general meaning of its two components in which *need* refers to *time* and *desirability* to *place* – i.e. is this the right time and is it the right place for locating the type of land-use/activity being proposed? Need and desirability can be equated to *wise use of land* – i.e. the question of what is the most sustainable use of land.

1.3.1. Strategic consideration

According to the Henkries Mega-Agripark develoment plan (Appendix 4) the Henkries Irrigation Development is aligned to several strategic policies and imperatives including:

- The New Growth Path (NGP) identified agriculture and its value chain as a catalyst for radical socio-economic transformation and focus on job creation and decent work towards the year 2020.
- The vision of the National Development Plan (NDP) is to create close to 1 million jobs in Agriculture and to reduce unemployment through:
    - Expanded irrigated agriculture (by at least 500 000ha).
    - Revitalization of underutilized land in communal areas.
    - Pick and support commercial sectors with highest potential for growth.
    - To support job creation in the upstream and downstream industries.
    - To find creative combinations between opportunities.
- The Agricultural Policy Action Plan (APAP) is aligned to the NGP, NDP and the MTSF 2014 -2019 action plan.
- The National Infrastructure Plan highlight 18 strategically integrated projects (SIPs) to fast track development and growth.
- SIP 11 deals specifically with agricultural and rural infrastructure to support the expansion of production and employment.
- Mega AgriPark Initiative of Department of Rural Development
- The River Valley Catalytic Project has also been identified as a framework to develop irrigation schemes through infrastructure, improved market access, social infrastructure and skills development.

1.3.2. Need

The Department of Agriculture, Land Reform and Rural Development business proposal motivates the need of the proposed development as follows (Appendix 4):

"According to the 2002 agricultural census (the last census data on District level) Namakwa contributed 7.3% to total Gross Farm Income of the Northern Cape. The importance of production under irrigation is relatively small if compared to the rest of the Province as the District produced 2.2% of the value of field crops and 2.4 % of the value of horticulture crops in the Northern Cape.

According to Global Insight calculations, Namakwa District was the only District that indicated a decrease in GDP per Capita for the period 1996 to 2012, dropping from R 36,692 to R 36,247 in constant 2005 prices. This means that output per capita decreased marginally over this period.

The situation for Nama Khoi and Khai-Ma Municipalities is even worse as the GDP per Capita decreased from R 40 593 to R 35 871 and from R 29 187 to R 24 020 for the same period. Richtersveld Municipality experienced a marginal increase from R 39 350 to R 41 279. This highlights the need for additional development in these areas to reverse this trend.

The Gross Value that was added by the agricultural sector as a percentage of the total value that was added in the Northern Cape in 2012 totalled 6.34%. The contribution of the value added by agriculture in Namakwa District (R 768 million) accounted for 10.41% of the total value added by the District.

In Nama Khoi- and Richtersveld Municipal areas agriculture employed 10% of total formal sector employment (4th highest contributing sector), but in Khai-Ma Municipal area agriculture employed 45% of total formal sector employment and is the highest contributing sector. It clearly underlines the role of agriculture as job creator in rural areas.

While there are moderate backward linkages with sectors such as manufacturing (e.g. fertilizers and chemicals), transport and services, minimum forward linkages exists with virtually no processing of agricultural products or agro-tourism ventures.

The potential for agro-tourism, agro-processing and value adding initiatives presents further opportunities for diversification of the local economy. It is recognized that successful promotion of agro-processing can impact positively on the incomes of primary producers, create employment and address market risks. It is also one of the means by which transformation of agriculture in the province can be achieved. Possible agro-processing ventures in the area include:

- *Date production*
- *Dried fruit and vegetables*
- *Animal feed products*
- *Cereals"*

There is a definite need, locally and nationally, for economic development and the creation of employment opportunities. In the Nama Khoi Municipality, the most viable formal development option, which will also relates to the most employment opportunities remains agriculture.

A development plan was prepared by the Department of agriculture (Appendix 4) in order to determine the economically viability of the proposed project especially in terms of beneficial use of the available resources (with emphasis on BEE).

1.3.3. Desirability

The following factors determine the desirability of the area for the proposed Henkries Mega-Agripark Development.

1.3.3.1. Land reform and black economic empowerment

The land under consideration is owned by the municipality and does not require to be procured in the open market. Income can be generated through agriculture which will significantly improve the economic situation of communities over time.

1.3.3.2. Location and Accessibility

From an agricultural point of view, the proposed locations is almost the only large enough remaining irrigation area within easy access to water at Henkries. The sites are also in close proximity to the source of water (Orange River).

1.3.3.3. Agricultural potential

Due to the dominant soil properties, inter alia, (i) topsoil horizons (ii) clay content (iii) effective root depth, (iv) dominant soil form and series, it can be concluded that the soils of Henkries on the proposed area for irrigation have low to high potential for irrigated agriculture according to the criteria of Schoeman (2004). The area cannot be considered as prime land, because prime land is defined as the best land available, primarily from national perspective. However, this area can be defined as unique agricultural land, due to specific combinations of location, climate or soil properties that make it highly suitable for a specific crop, more especially dates and grapes.

The impact on the production of annual summer and winter grain crops and pastures are probably small on a local scale. This assumption is based on the fact that raw input materials needs to be transported into the area over long distances while the raw products will have to be transported back again to far-off markets. The opportunity for value adding is relatively small. There is also no evidence of success on large lands that have been planted to summer as well as winter annual crops and pastures in the near past.

Fodder crops such as lucerne have proved to be very successful in this area, especially as a cash crop for ensuring stable income throughout the year. Lucerne produced in this area is highly suitable for milk producers as fodder and in current market conditions it is probably the most lucrative cash crop in the area.

1.3.3.4. Compatibility with the surrounding land use

The Namakwa District is the largest and least populous district in South Africa (Bourne et al., 2012). The majority of the District fall under private land tenure, with a smaller proportion under communal land use and around 3.5% of the land area are under formal conservation and 2.7% under mining permits (Todd et al. 2009).

The districts major land use is defined by livestock grazing and mining. Approximately 90% of the district's land surface is natural rangelands used for livestock grazing and the remaining 10% is a combination of mining, urban development, protected areas and crop agriculture (Todd et al. 2009; Bourne et al., 2012).

The surrounding Henkries Farm is well known for its date production. Over and above the approximately 60 ha of dates for commercial markets, cash crops and vegetables are produced under pivot irrigation on approximately 25 ha. Currently only a small portion of the date plantations produce quality fruit and are commercially viable. Infrastructures, including the packing and cooling facilities, are in a poor condition and need to be replaced and or renovated.

The scope of the project is to upgrade the packaging facilities & housing complexes, ESKOM electricity system, current irrigation infrastructure, mechanization and to expand the production of dates and dry grapes (raisins) under irrigation. The Department of Agriculture, Land Reform and Rural Development took over management of Henkries Farm from CASIDRA on 1 June 2008.

Apart from the land under management by the Department Agriculture, Land Reform and Rural Development other small farm holdings are also present along the Orange River. However, almost none of these are presently farmed to its potential (Refer to Figure 3) and it is hoped that the proposed development will act as a catalyst for improvement to these areas as well. Also evident from the aerial image is that most of the agricultural activities are concentrated along the banks of the Orange River.

The proposed activity will not be "out of character" with the surrounding land use and is expected to enhance the visual character of the area.

1.3.3.5. Job creation

The primary objective of the existing agricultural development project at Henkries Farm centres on economic growth, job creation and economic empowerment, through the production of dates, dry grapes (raisins) and mango's under irrigation.

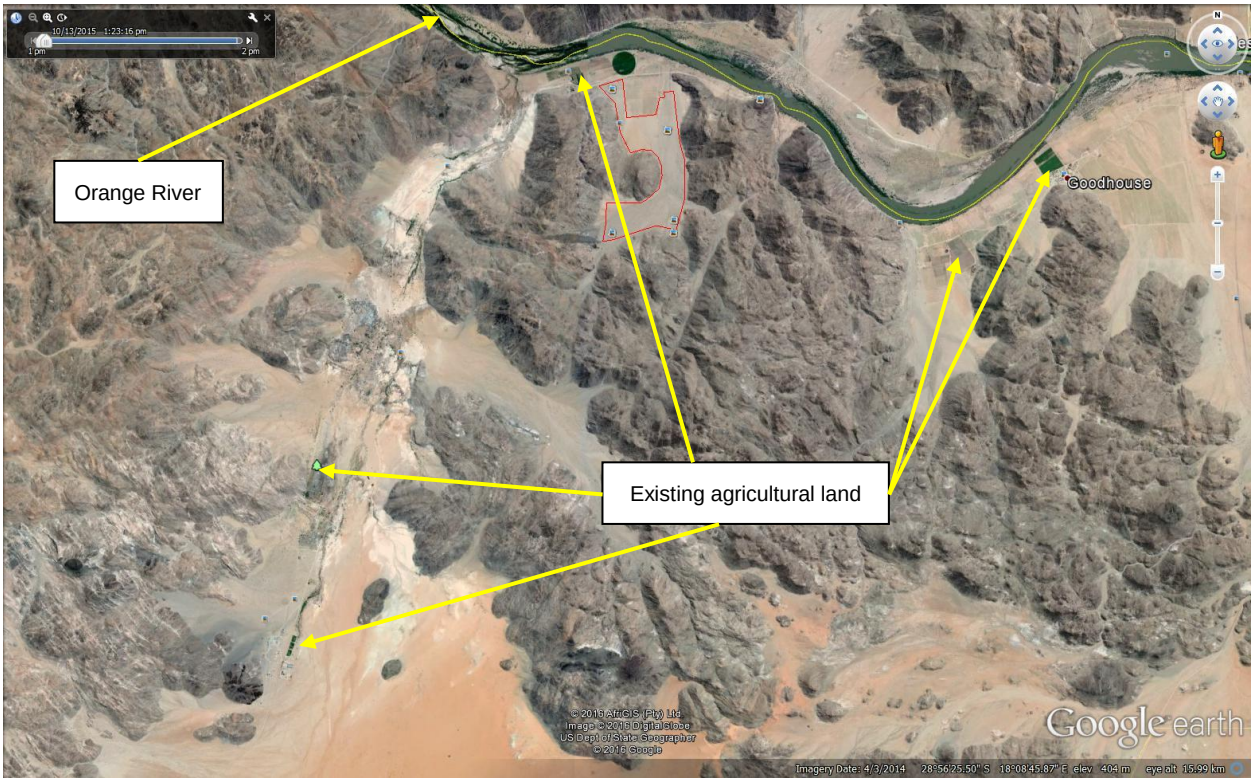

Figure 3: Aerial image showing the proposed development sites in relation to the surrounding land use

1.3.3.6. Food security

The communities of Henkries are characterized by severe poverty and a large proportion of families rely heavily on social grants for subsistence. Income from agricultural development will contribute directly and indirectly to food security, i.e. the availability of enough and affordable food for all.

1.3.3.7. Training and capacity building

The establishment of high value crops in Henkries will create a number of opportunities for schooled and unschooled individuals. Skills development though on-job and formal training will be a high priority in any development initiative.

2. LEGAL REQUIREMENTS

The current assessment is being undertaken in terms of the National Environmental Management Act (Act 107 of 1998, NEMA), to be read with section 24 (5): NEMA EIA Regulations 2014. However, the provisions of various other Acts must also be considered within this EIA.

The legislation that is relevant to this study is briefly outlined below.

2.1. THE CONSTITUTION OF THE REPUBLIC OF SOUTH AFRICA

The Constitution of the Republic of South Africa (Act 108 of 1996) states that everyone has a right to a non-threatening environment and that reasonable measure are applied to protect the environment. This includes preventing pollution and promoting conservation and environmentally sustainable development, while promoting justifiable social and economic development.

2.2. NATIONAL ENVIORNMENTAL MANAGEMENT ACT

The National Environmental Management Act (Act 107 of 1998) (NEMA), as amended, makes provision for the identification and assessment of activities that are potentially detrimental to the environment and which require authorization from the relevant authorities based on the findings of an environmental assessment. NEMA is a national act, which is enforced by the Department of Environmental Affairs (DEA).

On the 4 December 2014 the Minister of Environmental Affairs promulgated regulations in terms of environmental impact assessments, under sections 24(5) and 44 of NEMA, namely the EIA Regulations 2014, as amended (GN No. R 326), which consists of:

- GN No. R. 327 (Listing Notice 1);
- GN No. R. 325 (Listing Notice 2); and
- GN No. R. 324 (Listing Notice 3).

Listing Notice 1 and 3 are for a Basic Assessment and Listing Notice 2 for a full Environmental Impact Assessment.

2.2.1. Listed activities

According to the 2014 EIA regulations (as amended) the following potentially listed activities may be triggered (Refer to Table 1).

Table 1: Listed activities identified that might potentially be triggered by the proposed development

GN R327	Short description of relevant Activity(ies) in terms of Listing Notice 1	Description of specific portion of the development that might trigger the listed activity.
8	Development of Agri-industrial facilities larger than 2 000 m^2.	**Not applicable** to this application.
9	Water & storm water infrastructure.	**Applicable**: Two major pipelines to be constructed with dimension as follows: Phase 1: 2.014 km long, 0.35 Ø, 72.7778 l/s Phase 2: 3.042 km long, 0.5 Ø, 244.444 l/s
12	Development within a water course.	Likely: The proposed development is likely to impact on a number of small seasonal or ephemeral drainage areas.
13	Off stream storage of water with a combined capacity of >50 000 m^3.	Not Applicable. Two reservoirs will be constructed, but their combine capacity (6 690 + 21 120 = 27 810 m^3) will be less than the 50 000 m^3 cut-off.
19	Moving of more than 10m^3 of material within a water course.	The proposed development is likely to impact on a number of small seasonal or ephemeral drainage areas.
GN R325	**Short description of relevant Activity(ies) in terms of Listing Notice 2**	**Description of specific portion of the development that might trigger the listed activity.**
15	Clearance of 20 ha or more of indigenous vegetation.	The development also proposes the development of an additional agricultural land of approximately 150 ha (currently covered by indigenous vegetation).
GN R324	**Short description of relevant Activity(ies) in terms of Listing Notice 3**	**Description of specific portion of the development that might trigger the listed activity.**
2	Development of a reservoir larger than 250 m^3.	**Applicable**. Two reservoirs will be constructed, both with a capacity larger than 250 m^3 cut-off.
4	Development of roads larger than 4 m.	It is possible that the main access roads may be designed to be wider than 4m.
14	Development of infrastructure larger than 10 m^2 within a water course.	The proposed development is likely to impact on a number of small seasonal or ephemeral drainage areas and although unlikely, infrastructure may be located within the original location of such water courses.

2.2.2. Environmental impact assessment

This scoping and impact assessment was undertaken to identify and assess potential environmental issues as part of the overall environmental impact assessment process as required in terms of the 2014 EIA regulations as amended.

2.2.3. Principles of environmental management

The principles of environmental management as set out in section 2 of NEMA have been taken into account. The principles pertinent to this activity include:

- People and their needs will be placed at the forefront while serving their physical, psychological, developmental, cultural and social interests. The activity seeks to provide additional employment and economic development opportunities, which are a local and national need – ***the proposed activity is expected to have a significant beneficial impact on the people of Henkries, especially developmental and social benefits, as well as providing employment and economic development opportunities (with emphasis on BEE development).***

- Development will be socially, environmentally and economically sustainable. Where disturbance of ecosystems, loss of biodiversity, pollution and degradation, and landscapes and sites that constitute the nation's cultural heritage cannot be avoided, are minimised and remedied. The impact that the activity will potentially have on these will be considered, and mitigation measures will be put in place - ***potential impacts will be identified and considered, including through the public participation process. Mitigation measures will be addressed and included in the EMP***.
- Where waste cannot be avoided, it will be minimised and remedied through the implementation and adherence of the Environmental Management Programme (EMP) – ***this will be included in the EIR***.
- The use of non-renewable natural resources will be responsible and equitable.
- The negative impacts on the environment and on people's environmental rights will be anticipated, investigated and prevented, and where they cannot be prevented, will be minimised and remedied.
- The interests, needs and values of all interested and affected parties will be taken into account in any decisions through the Public Participation Process.
- The social, economic and environmental impacts of the activity will be considered, assessed and evaluated, including the disadvantages and benefits.
- The effects of decisions on all aspects of the environment and all people in the environment will be taken into account, by pursuing what is considered the best practicable environmental option.

2.2.4. EIA Guideline and information document series

The following are the latest guidelines that form part of the DEA *Environmental Impact Assessment Guideline and Information Document Series (Dated: March 2013)*:

- *Guideline on Transitional Arrangements*
- *Guideline on Alternatives*
- *Guideline on Public Participation*
- *Guideline on Exemption Applications*
- *Guideline on Appeals*
- *Guideline on Need and Desirability*
- *Information Document on the Interpretation of the Listed Activities*
- *Information Document on Generic Terms of Reference for EAPs and Project Schedules*

2.3. NATIONAL HERITAGE RESOURCES ACT

The protection and management of South Africa's heritage resources are controlled by the National Heritage Resources Act (Act No. 25 of 1999). South African National Heritage Resources Agency (SAHRA) is the enforcing authority.

In terms of Section 38 of the National Heritage Resources Act, SAHRA will require a Heritage Impact Assessment (HIA) where certain categories of development are proposed. Section 38(8) also makes provision for the assessment of heritage impacts as part of an EIA process and indicates that if such an assessment is found to be adequate, a separate HIA is not required.

The National Heritage Resources Act requires relevant authorities to be notified regarding this proposed development, as the following activities are relevant:

- *any development or other activity which will change the character of a site exceeding 5 000 m² in extent;*

A heritage impact assessment (HIA) study was commissioned. The scoping report was loaded onto SAHRA website for provisional comments.

Furthermore, in terms of Section 34(1), no person may alter or demolish any structure or part of a structure, which is older than 60 years without a permit issued by the SAHRA, or the responsible resources authority. Nor may anyone destroy damage, alter, exhume or remove from its original position, or otherwise disturb, any grave or burial ground older than 60 years, which is situated outside a formal cemetery administered by a local authority, without a permit issued by the SAHRA, or a provincial heritage authority, in terms of Section 36 (3). In terms of Section 35 (4), no person may destroy, damage, excavate, alter or remove from its original position, or collect, any archaeological material or object, without a permit issued by the SAHRA, or the responsible resources authority.

2.4. NATIONAL WATER ACT

The National Water Act, Act 36 of 1998 (NWA) promotes the protection, use, development, conservation, management, and control of water resources in a sustainable and equitable manner. Besides the provisions of NEMA for this EIA process, the proposed development is likely to require authorizations under the National Water Act (Act N0. 36 of 1998).

- The Department of Water Affairs will be contacted with regards to the registration of water rights and if needed, a consultant will be appointed to facilitate the Water Use Licence Application.

The Department of Water Affairs, who administer that Act, will be a leading role-player in the EIA.

2.5. NATIONAL ENVIRONMENTAL MANAGEMENT: BIODIVERSITY ACT

The National Environmental Management: Biodiversity Act, 2004 (Act No. 10 of 2004) (NEMBA) is part of a suite of legislation falling under NEMA, which includes the Protected Areas Act, the Air Quality Act, the Integrated Coastal Management Act and the Waste Act. Chapter 4 of NEMBA deals with threatened and protected ecosystems and species and related threatened processes and restricted activities. The need to protect listed ecosystems is addressed (*Section 54*).

2.6. NATIONAL FORESTS ACT

The National Forests Act (NFA), Act 84 of 1998 (as amended): supports sustainable forest management and the restructuring of the forestry sector. It also made provision for the protection of nationally protected tree species in terms of Section 12(d) of the NFA. Refer to the latest list of protected tree species.

A biodiversity study was commissioned. Part of the brief of this study is to evaluate the potential impact on any nationally protected tree species that may be present on the property and to apply for a licence regarding protected trees in terms of the NFA (as amended).

2.7. NORTHERN CAPE NATURE CONSERVATION ACT

On the 12th of December 2011, the new Northern Cape Nature Conservation Act 9 of 2009 (NCNCA) came into effect, which provides for the sustainable utilization of wild animals, aquatic biota and plants. Schedule 1 and 2 of the act give extensive lists of specially protected and protected fauna and flora species in accordance with this act. The NCNCA is a very important Act in that it put a whole new emphasis on a number of species not previously protected in terms of legislation.

It also put a new emphasis on the importance of species, even within vegetation classified as “Least Threatened” (in accordance with GN 1002 of 9 December 20011, promulgated in terms of the National Environmental Management Biodiversity Act 10 of 2004). Thus even though a project may be located within a vegetation type or habitat previously not considered under immediate threat, special care must still be taken to ensure that listed species (fauna & flora) are managed correctly.

A biodiversity study was commissioned. Part of the brief of this study is to evaluate vegetation and plant species and to evaluate the potential impact on species protected in terms of this Act. A flora permit will be applied for if necessary.

3. ALTERNATIVES

Alternatives with regards to a proposed activity, means different means of meeting the general purposes 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.

Henkries lies in a semi-arid region where water is a scarce resource limiting development options. However, being located next to the Orange River, gives Henkries the competitive advantage of being able to utilise this resource for irrigation agriculture. Agriculture is seen as being one of the most viable means of establishing economic growth, job creation and economic empowerment in this area. It is also recognized that successful promotion of agriculture and agro-processing can impact positively on the incomes of primary producers, create employment and address market risks. It is also one of the means by which transformation of agriculture in the province can be achieved.

The Henkries area has a further competitive advantage with its hot and sunny climate with the highest solar radiation intensity in South Africa, making it appropriate for private and large-scale solar energy generation. However, this type of development is not likely to address job creation or economic empowerment nearly as well as agriculture.

The Department of Agriculture, Land Reform & Rural Development recognised the opportunity to address transformation of agriculture, whilst at the same time creating economic growth, job creation and empowerment. As such the development focused on agricultural development and alternatives are mostly related to location and layout and crop types.

3.1. PROPERTY ALTERNATIVES

The proposed development aims at unlocking the agricultural potential of Henkries through irrigated farming. This plan includes the development of a further 150 ha of irrigation for the establishment of high value crops outside of the Orange River flood plain. At Henkries the most suitable location, remaining for development, was sourced and evaluated, which led to the current proposal.

The land under consideration (and the whole of Henkries mond), forms part of the Steinkopf Commonage (Farm Steinkopf No. 22), which is owned by the municipality and does not require to be procured in the open market. It also includes all of Henkries and its surrounding areas (293 405 ha in size), and as such there is no property alternatives at Henkries mond area. Similar

projects at other locations (e.g. the Onseepkans Agricultural development are being investigated by the Department, but they are separate applications all together.

Property alternatives is not possible.

3.2. LAYOUT ALTERNATIVES

The overall aim of the Department is to upgrade existing facilities & housing, to revitalize existing agricultural land (± 40 ha) and to expand the production of dates and dry grapes (raisins) under irrigation by establishing a further approximately 14-150 ha of agricultural land. The expansion of infrastructure includes new pipelines and two storage reservoirs. Upgrades will also be made at the extraction point (larger and/or additional pumps to be located at the existing Henkries mond agricultural extraction point), which also supplies water to the existing farming units at Henkries.

At Henkries, layout alternatives for an approximate 150 ha development, within easy range of the existing infrastructure (irrigation system) is very limited (Figure 4). The physical characteristics of the area (topography being the main limiting factor) and soil conditions, ease of access and costs of linking it with existing infrastructure (which will also impact on costs of maintenance) are all limiting factors. Only one suitable location was sourced. Soil conditions at the other possible viable locations made them unsuitable.

Figure 4: Overview of surrounding landscape showing topographical limitations

Figure 4 shows some theoretical alternatives, but they have all being ruled out as part of the scoping and viability studies done by the Department. In essence Alternative 2 might provide some options, but will be severely limited by the Brak River (which run down this passage) and the unfavourable (very brackish) soil conditions. Alternative 3 will significantly increase development- as well as maintenance cost as it is much further away from the Orange River.

3.2.1. Alternative 1 – The preferred alternative

The Department of Agriculture, Land Reform and Rural Development proposes invest in the revitalisation of the agricultural potential of the larger Henkries Settlement with the main aim of job creation, poverty relieve and social investment. The preferred development proposes the development of approximately 150 ha of additional agricultural land outside of the floodplain area at Henkries mond. The main drivers for choosing the preferred alternative (Alternative 1) were availability of land (under government control), suitable soil type, topography and proximity to existing infrastructure. It made Alternative 1 the most logical choice (Refer to Figure 2 & 4).

3.2.2. Alternative 2 – Layout alternative

Alternative 2 is also located relatively close to the existing infrastructure and there are quite significant tracts of open land (although the development will have to be fragmented as a result of the landscape). However, development will be severely limited by the Brak River (which run down this valley – the Henkries mond valley) and the very unfavourable (brackish) soil conditions. The fragmented development will also significantly increase development and maintenance costs (Figure 4).

3.2.3. Alternative 3 – Layout alternative

Alternative 3 is likely to be as attractive as the preferred alternative with suitable soil types and large enough available land. However, it is located significantly further away from the Orange River, which will increase development- and maintenance costs considerably (Figure 4).

3.3. ACTIVITY ALTERNATIVE

The draft viability study done by the Department (31 July 2015) evaluates the agricultural potential of the property (Refer to Paragraph 9) and also discuss other activity alternatives.

The area lies in a semi-arid region and fresh water is a scarce resource in the district. The only sustainable source of good quality irrigation water is the Orange River. Traditionally the main land use is livestock grazing. But because of the scarcity of water (unless next to the river) and desert like vegetation, the grazing capacity is very low, meaning that its potential is very low. Likewise, the cultivation of crop is limited to areas in close proximity to the Orange River. It has implications for the types of activities that can take place. In terms of agriculture the most appropriate crops and the most water-efficient irrigation technologies need to be promoted.

In terms of biodiversity the area is rich in natural flora which can be harnessed as a unique tourism attraction.

The area has a further competitive advantage with its hot and sunny climate with the highest solar radiation intensity in South Africa, making it appropriate for private and large-scale solar energy generation.

However, none of these activity alternatives is thought to be able to address the main purpose of this project, which aims at economic growth, job creation and economic empowerment.

It concludes that the area cannot be considered as prime land, because prime land is defined as the best land available, primarily from a national perspective. However, this area can be defined as unique agricultural land, due to specific combinations of location, climate or soil properties that make it highly suitable for a specific crop.

3.4. THE NO-GO ALTERNATIVE

The Department of Agriculture, Land Reform and Rural Development proposes to invest heavily in the revitalisation of the agricultural potential of the larger Henkries Settlement with the main aim of job creation, poverty relieve and social investment.

The option of not investing in this development (expanding agricultural land), will mean that none of the potential environmental impacts will be triggered. However, it will also mean that none of the direct or indirect socio-economic benefits of the proposed development will be realised, which will remain to impact negatively on a province already struggling with high unemployment rates and poor socio-economic prospects.

4. SITE DESCRIPTION

4.1. LOCATION

Henkries is a small agricultural settlement in the Northern Cape Province next to the Orange River and in the Namakwa District Municipality (Nama Khoi Local Municipality). It is located approximately 90 km north of Springbok and, 13 km west of Goodhouse and borders on Namibia (Refer to **Appendix 1**).

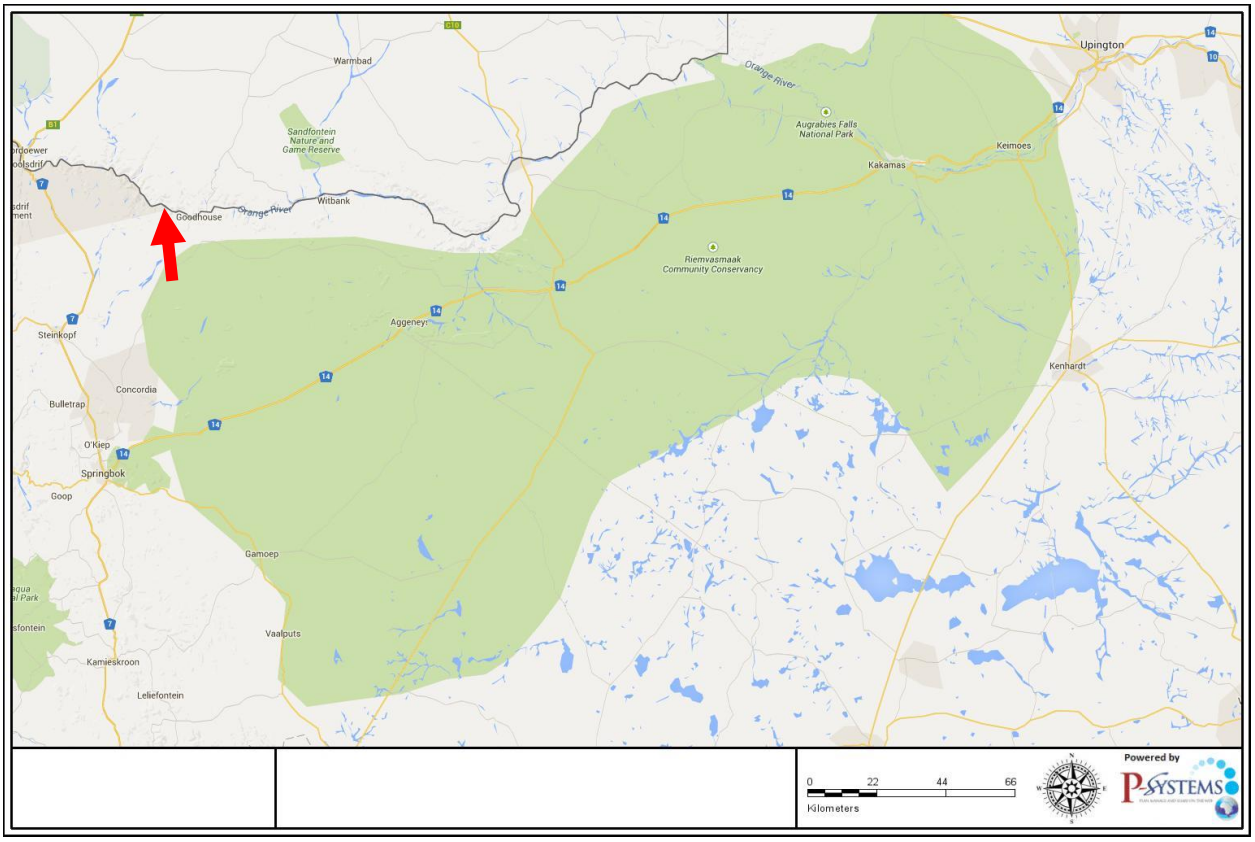

Figure 5: Showing the location of Henkries within the Northern Cape Province

The proposed sites will be located away from the Orange River floodplains, in between the rocky outcrops (Refer to Figure 6).

4.1.1. Surveyor General code

The proposed development is located on the Remainder of Farm Steinkopf No. 22, Springbok (Figure 6).

The SG21 Code: C053 0000 00000022 00000

4.1.2. Site coordinates

Table 2: GPS coordinates of the proposed development areas (Centre points only)

DESCRIPTION	Farm Name	LATITUDE AND LONGITUDE
Agri-Megapark midpoint	Rem Farm Steinkopft 22, Springbok	S28 54 41.2 E18 09 10.8
Agri-Megapark mid-north	Rem Farm Steinkopft 22, Springbok	S28 54 10.3 E18 09 10.0
Agri-Megapark mid-south	Rem Farm Steinkopft 22, Springbok	S28 55 01.6 E18 08 53.0
Small Reservoir (Phase 1)	Rem Farm Steinkopft 22, Springbok	S28 54 10.3 E18 09 10.0
Large Reservoir (Phase 2)	Rem Farm Steinkopft 22, Springbok	S28 54 41.2 E18 09 10.8

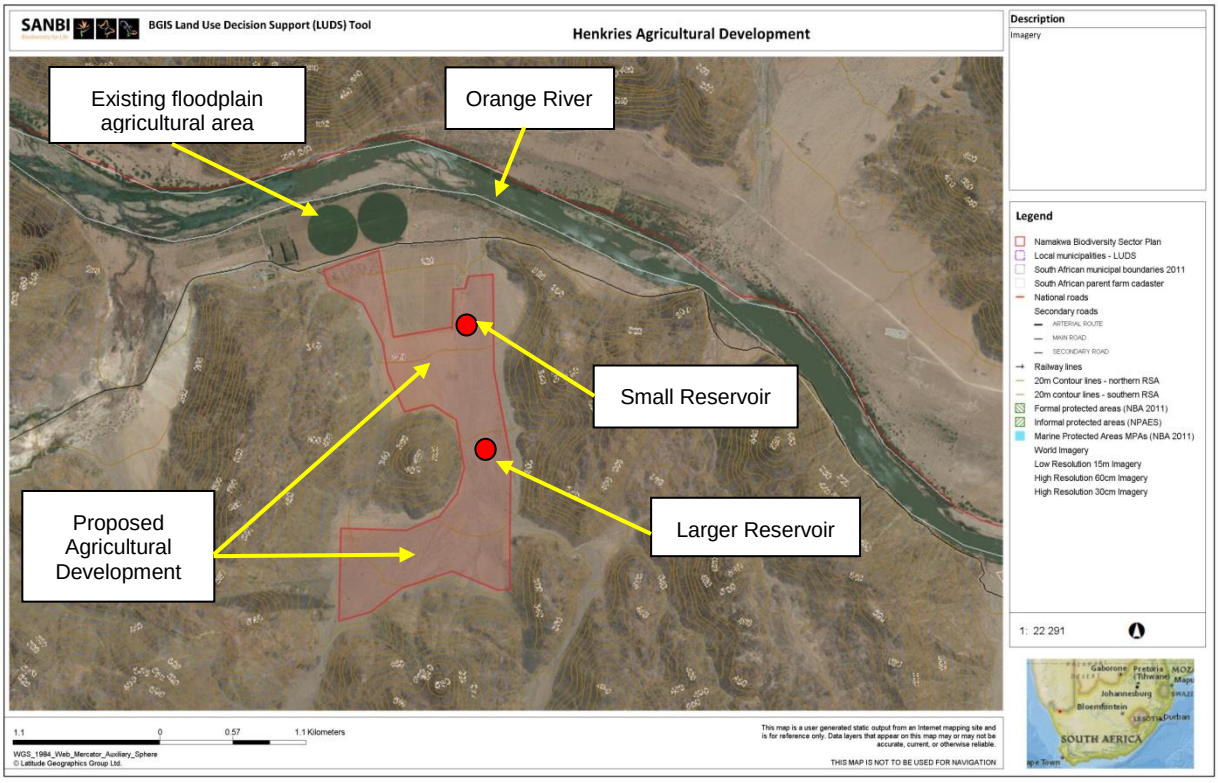

Figure 6: Proposed development area at Henkries

4.2. CLIMATE

This Namakwa District of the Northern Cape Province is known for its semi-desert climate with extreme temperatures ranging from up to 45˚C in summer to - 2˚C in winter. The climate is variable due to its position in the transitional area between winter and summer rainfall. The winters are short and the area is well known for its high summer temperatures. All regions with a rainfall of less than 400 mm per year are regarded as arid. The Henkries area falls within the desert biome or **hyperarid region** of fringing the western South African shoreline, Southern Angola and Namibia. The desert biome is characterised by ecological extremes and of all the biomes in SA it has the lowest amount of and the variability in rainfall. Henkries normally receives about 82.5 mm of rain per year, with most rainfall occurring mainly during autumn. Table 3, below, shows the

average rainfall values for Henkries as measured between January 2000 and December 2008 (www.weatheronline.co.uk). It receives the lowest rainfall (0.3 mm) in November and the highest (26.4 mm) in April.

Table 3: Average precipitation for Henkries mond as measured from January 2000 to December 2008

Jan	Feb	Mar	Apr	May	Jun	
8.4	**9.8**	**11.6**	**26.4**	**4.8**	**5.4**	[mm]
83	90	90	94	87	92	Data availability[%]

Jul	Aug	Sep	Oct	Nov	Dec	
2.5	**7.1**	**0.9**	**4.2**	**0.3**	**1.0**	[mm]
91	89	93	89	85	87	Data availability[%]
Averaged Value (January 2000 - December 2008) : **82.5 mm**						

4.3. SOILS

According to the soil study done by BVi Engineers (Appendix 6.1) Dundee soil from the Sabie family was the only soil form found in the surveyed area, with a poorly expressed orthic A horizon. The texture is sand with 37 % gravel fragments on average. The gravel is of a variety of sizes. The soil meets the requirements for irrigation. The chemical properties limit the selection of crops which prefer or are insensitive to a high pH.

4.4. VEGETATION

In accordance with the 2006 Vegetation map of South Africa, Lesotho and Swaziland (Mucina & Rutherford, 2006) two broad vegetation types are expected in the vicinity of the proposed development, namely Lower Gariep Alluvial Vegetation along the Orange river alluvial plain and Eastern Gariep Rocky Desert inland of the alluvial plain. Only Eastern Gariep Rocky Desert is expected to be impacted by the proposed project (Figure 7). However, Eastern Gariep Plains Desert is normally expected in the sheet washed plains between the rocky outcrops covered with Eastern Gariep Rocky Desert vegetation (PB Consult, 2016).

According to the National list of ecosystems that are threatened and in need of protection (GN 1002, December 2011) Eastern Gariep Rocky Desert is classified as Least Threatened.

However, it is important to note that even though Eastern Gariep Rocky Desert (and Eastern Gariep Plains Desert), is classified as least threatened, it falls within the South African Desert Biome, in this case fringing on the Namibian desert. The Desert Biome is a hyperarid region of great age and one with extraordinary high diversity of organisms (including many endemics) and adaptions. It includes both winter- and summer rainfall areas, making it one of the most interesting

hyperarid regions of the world. Compared with other desert regions, plant species richness is very high (especially the Richtersveld) and does not differ much from that of the Succulent Karoo (Mucina & Rutherford, 2006). However, not all parts of this biome are equally rich in species diversity. Plant species richness of the western Gariep Lowland Desert vegetation unit, is thought to be less rich than that of for example the Richtersveld and is described by Mucina & Rutherford (2006) as moderate.

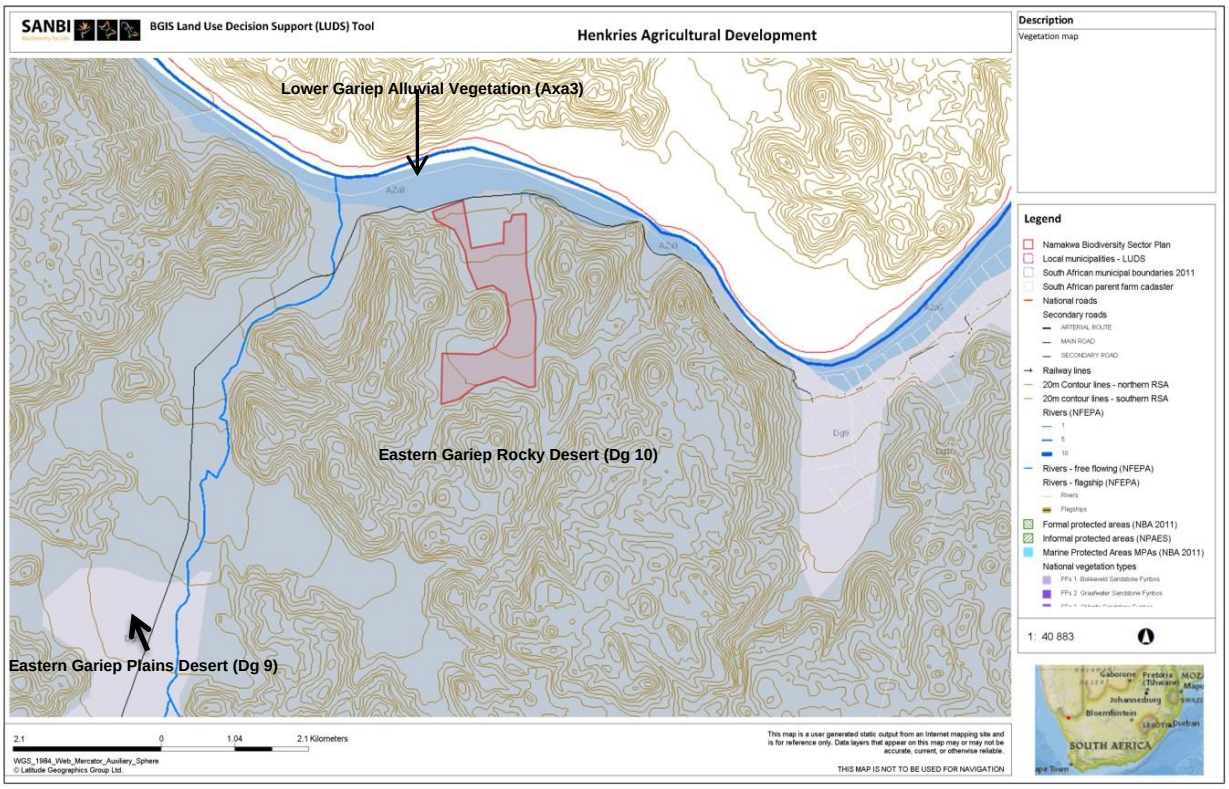

Figure 7: Desert Biome vegetation types expected at Henkries

The vegetation type is described as occurring on hills and mountains (up to 650 m of relative altitude from their base), mostly with bare rock outcrops and covered with very sparse shrubby vegetation in crevices, usually separated by broad sheet-wash plains (Eastern Gariep Plains Desert).

4.5. NAMAKWA DISTRICT BIODIVERSITY SECTOR PLAN

The Namakwa District Biodiversity Sector Plan (Figure 8) is intended to help guide land-use planning, environmental assessments and authorisations; and, natural resource management in order to promote sustainable development. It has been developed to further the awareness of the unique biodiversity in the area, the value this biodiversity represents to people and promote the management mechanisms that can ensure its protection and sustainable utilisation (Draft Namakwa District Biodiversity Sector Plan, Version 2).

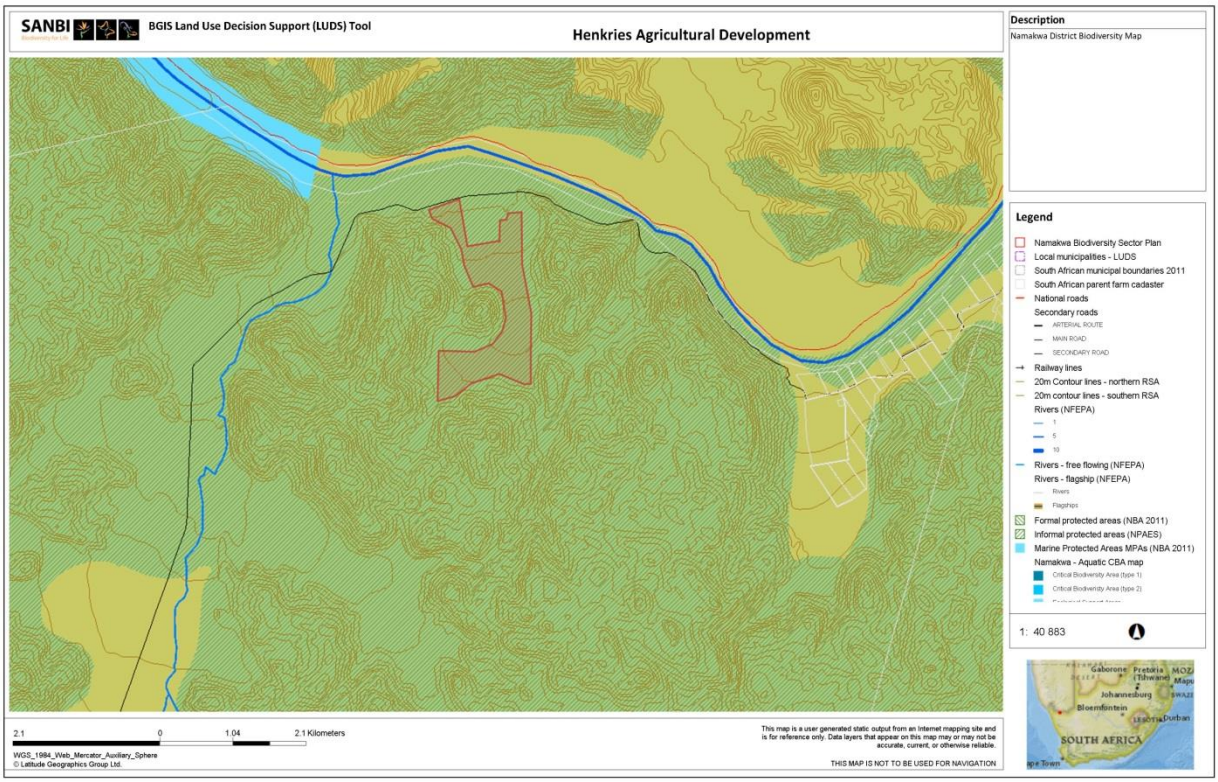

Figure 8: Namakwa District Biodiversity Plan showing the Henkries area

According to the CBA map for the Henkries area it is clear that the proposed sites as well as the whole of Henkries is located within proposed CBA 1 or CBA 2 areas. Ideally one would like to limit potential impact on such CBA areas, but in this case it will be impossible.

4.6. FRESHWATER

The proposed agricultural development will be located on an open sheet washed valley floor with a very low gradient within a hyperarid region (average rainfall of 82.5 mm per year). Much of this rainfall is experienced in thunder storms resulting in sudden flash floods, draining higher lying kopjes into the open (wider) sheet washed valley floor, typically resulting in deposition of sediment giving rise to an alluvial fan being formed within the valley floor (Biodiversity Scan, **Appendix 6.2**). However, rainfall can at best be described as episodic or sporadic, and water will only flow for very short periods of time (Non-perennial), with intervals that can vary greatly. As a result the soils will rarely be inundated for longer than a couple of days at a time (if so long).

Photo 1: A photo showing one of the better established drainage lines

The alluvial fan that was formed within the sheet washed valley floor proposed for the agricultural development supports a number of small intermittent channels (Biodiversity Assessment, **Appendix 6.2**). A few of these channels are relatively well defined, and may even sometimes be delineated by grassy vegetation (Photo 1**Error! Reference source not found.**). But because of i ts non-perennial and very short lived function these channels can at best be described as drainage lines in a very arid region. Furthermore, they are very limited in size and as such are not regarded as of significant ecological importance. It is, however, important that agricultural development will have to design erosion drainage and erosion control measures in order to provide for drainage of flash floods (thunder storms).

4.7. SOCIO-ECONOMIC CONTEXT

According to the 2002 agricultural census (the last census data on District level) Namakwa contributed 7.3% to total Gross Farm Income of the Northern Cape. The importance of production under irrigation is relatively small if compared to the rest of the Province as the District produced 2.2% of the value of field crops and 2.4 % of the value of horticulture crops in the Northern Cape.

According to Global Insight calculations, Namakwa District was the only District that indicated a decrease in GDP per Capita for the period 1996 to 2012, dropping from R 36,692 to R 36,247 in

constant 2005 prices. This means that output per capita decreased marginally over this period. The situation for Nama Khoi and Khai-Ma Municipalities is even worse as the GDP per Capita decreased from R40, 593 to R35, 871 and from R29, 187 to R24, 020 for the same period. Richtersveld Municipality experienced a marginal increase from R39, 350 to R41, 279. This highlights the need for additional development in these areas to reverse this trend.

The Gross Value that was added by the agricultural sector as a percentage of the total value that was added in the Northern Cape in 2012 totalled 6.34%. The contribution of the value added by agriculture in Namakwa District (R 768 million) accounted for 10.41% of the total value added by the District.

In Nama Khoi- and Richtersveld Municipal areas agriculture employed 10% of total formal sector employment (4th highest contributing sector), but in Khai-Ma Municipal area agriculture employed 45% of total formal sector employment and is the highest contributing sector. It clearly underlines the role of agriculture as job creator in rural areas.

While there are moderate backward linkages with sectors such as manufacturing (e.g. fertilizers and chemicals), transport and services, minimum forward linkages exists with virtually no processing of agricultural products or agro-tourism ventures.

The potential for agro-tourism, agro-processing and value adding initiatives presents further opportunities for diversification of the local economy. It is recognized that successful promotion of agro-processing can impact positively on the incomes of primary producers, create employment and address market risks. It is also one of the means by which transformation of agriculture in the province can be achieved. Possible agro-processing ventures in the area include:

- Date production
- Dried fruit and vegetables
- Animal feed products
- Cereals

4.7.1. Demographic Profile of Namakwa District

Total Population	124 940
As Percentage of South Africa	0.25%
As Percentage of Northern Cape	11.65%
Population Density (people per km^2)	0.9
South Africa	3.91
Northern Cape	2.62

4.8. HERITAGE FEATURES

In terms of Section 38 of the National Heritage Resources Act (Act No. 25 of 1999) (NHRA), SAHRA require an impact assessment where certain categories of development are proposed. Since the footprint of the proposed development will exceed 5 000 m² in extent it triggers the NHRA.

An Archaeological Impact Assessment (AIA) has been commissioned (Refer to **Appendix 6.3**) in order to evaluate the possible impacts on heritage or archeologically and to advise SAHRA of the likelihood of impacts on existing heritage as well as recommendations for impact minimisation (if required).

5. PROCESS TO DATE

In terms of the NEMA EIA process the Scoping and EIA process must follow certain prescribed process or steps. The section below outlines the various tasks undertaken to date, the members of the team involved in the project, as well as the Public Participation Process.

5.1. TASKS UNDERTAKEN TO DATE

Table 4: Tasks undertaken in the EIA to date

TASKS	DAYS	TARGET DATE	Target Achieved Yes / NO
Scoping phase	**44 days maximum**		
Prepare and submit Application document			Yes
DEA to acknowledge application and provide formal reference number	10		Yes
Submit Scoping Report for comment	30	23 Nov 2016 To 21 Jan2017	Yes
Prepare comments and response report	2	Jan 2017	Yes
Incorporate comments and prepare Final Scoping Report	2	Feb 2017	Yes
Submit Final Scoping Report to DEA for decision on scoping process	43	Feb 2017	Yes

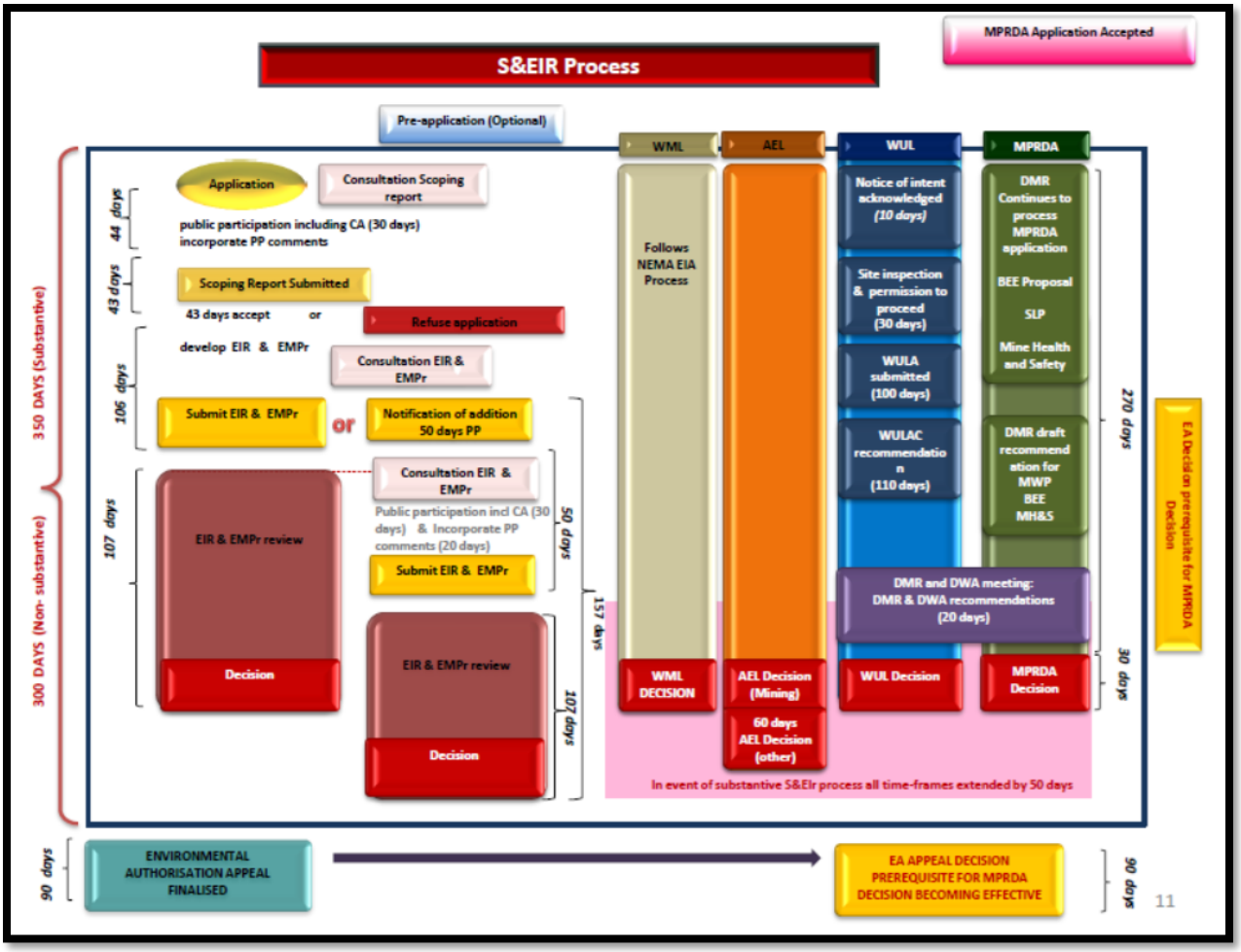

Figure 9: Summary of the Scoping and EIA 2014 process

Figure 9 gives a summary of the EIA process and provides an understanding of the times frames for the different phases of the EIA process.

5.2. TASKS TO BE UNDERTAKEN DURING THE EIA PHASE

The following must be undertaken during the EIA phase of the process

Table 5: Tasks to be undertaken during the EIA process

Impact assessment phase *(Note this phase can only start after decision from CA)*	**106 days maximum**	
Compile Draft Environmental Impact Report (EIR) for public comment based on specialist information (THIS DOCUMENT)	30	June 2017
Submit Impact Report to Competent Authority		23 June 2017 to 23 July 2017
Submit Draft Impact Report (EIR) to interested and affected parties (I&AP) for comments	30	
Receive all comments and incorporate responses to comments into the Final Environmental Impact Assessment	30	August 2017
Prepare Final Environmental Impact Report	16	August 2017
Submit Final Environmental Impact Report to DEA for decision	107	August 2017

Please refer to Figure 9 above to see where the public participation process fits into the environmental impact assessment. The Interested and Affected Parties (I&AP) will have a chance to view and comment on all reports that are submitted. The figures also indicate the applicable timeframes of each stage of the process. If required, meetings with key stakeholders will be held.

At the end of the commenting period, the EIR will be revised in response to feedback received from I&Aps. All comments received as well as responses to comments will be incorporated into the Final Environmental Impact Report (EIR). The Final EIR will then be submitted to DENC for consideration and decision-making.

Correspondence with I&AP will be via post, fax, telephone, email and newspaper advertisements.

Should it be required the process may be adapted depending on input received during the on-going process and as a result of public input. DENC will be informed if any changes in the process.

5.3. PROFESSIONAL TEAM

The following professionals are part of the project team

Table 6: Professional Project Team

Discipline	Specialist	Organisation
Environmental Assessment Practisioner (EAP)	PJJ Botes & Inge Erasmus	Enviro Africa
Soil study	Marius Pretorius	BVi Consulting Engineers
Biodiversity & Botanical scan	Peet Botes	PB Consult
Heritage assessment	Jonathan Kaplan	Agency of Cultural Resource Management

5.4. PUBLIC PARTICIPATION

5.4.1. Public Participation undertaken during the Scoping Phase:

Interested and Affected Parties (I&APs) were identified throughout the process. Landowners adjacent to the proposed site, relevant organs of state, organizations, ward councillors and the Local and District Municipality were added to this database. A complete list of organisations and individual groups identified to date is shown in **Appendix 5.1.**

Public Participation was conducted for this proposed development in accordance with the requirements outlined in Regulation 41, 42,43 and 44of the NEMA EIA Regulations, as well as the Department of Environmental Affairs and Development Planning's guideline on Public Participation 2011. The issues and concerns raised will be dealt with as part of this application.

Each subsection of Regulation 41 contained in Chapter 6 of the NEMA EIA Regulations will be addressed separately to thereby demonstrate that all potential Interested and Affected Parties (I&AP's) were notified of the proposed development.

Table 7: PPP Process

R41	Posters, Advertisement & Notification letters
(2) (a) (i)	Posters was displayed on the property fence at both entrances to the site, next to the Henkries – Goodhouse road. Posters were also placed at the Henkries café, the Department of Agriculture Offices and at the Steinkopf Municipal building (please refer to **Appendix 5.1.4**). The posters contained all details as prescribed by R41 (3) (a) & (b) and the size of the on-site poster were 60cm by 42cm as prescribed by section 41 (4) (a).
(ii)	N/A No alternative site
(2) (b) (i)	An initial notification letter was posted to the landowner (Nama Khoi Municipality) (please refer to **Appendix 5.1.4** & **5.1.5** for proof of notification letters sent).
(2) (b) (ii)	Initial notification letters were delivered to landowners and occupiers adjacent to the site. Please refer to **Appendix 5.1.3** & **5.1.4** for proof of notifications.
n(2) (b) (iii)	Notification letters were sent to the municipal ward councilor for Henkries. Please refer to **Appendix 5.1.3 & 5.1.5**
(iv)	Notification letters were sent to the Municipal Manager of the Municipality who is also the land owner (Appendix **5.1.5**)
(v)	Notification letters were sent to the following organs of state: ○ Department of Water Affairs ○ DENC (Department of Environment and Nature Conservation ○ DAFF (Department of Agriculture, Forestry & Fisheries) ○ SAHRA (South African Heritage Recourse Agency) (Please refer to **Appendix 5.2.2)**
(vi)	Notification letters were sent to neighbours (Please refer to **Appendix 5.1.3 & 5.1.4**)
(2) (c) (i)	An advert was placed in Die Plattelander of 4 September 2015 (Please refer to **Appendix 5.1.2**)
R42 & 34	**Register of I&AP**
(a), (b), (c), (d)	A register of interested and affected parties was opened and maintained and is available to any person requesting access to the register in writing (Please refer to **Appendix 5.1.1 & 5.2.1 (updated)** for the list of I&AP).
R43	**Registered I&AP entitled to comments**
3	I&AP were given 30 days for comments during the initial public participation phase

R44	I&AP to be recorded
	A summary of issues raised by I&AP are addressed in the comments and response report. No comments were made during the first round of public participation. (Refer to **Appendix 5.2.3.1 & 5.2.4** for comments from DAFF during the second round of public participation)

5.4.2. Public Participation undertaken during the EIA phase:

Groups and individuals identified as Interested and Affected Parties during the initial Public Participation Process were added to the I&AP register The updated list of organisations and individual groups identified as was well as those I&Aps that have registered are given in **Appendix 5.2.1**.

The Scoping report was sent to all registered and affected parties as well as the relevant registered state organizations (Please refer to **Appendix 5.3** for proof). DENC acknowledged the receipt of the Scoping Report and granted permission to proceed with the EIR. (Please refer to Appendix

Full copies of the EIR will be sent to all Registered I&AP, and will be notified of the Environmental Impact Report (EIR) by means of notification letters (via preferred method of communication), informing them of the availability of the Draft EIR and will be invited to comment. The EIR will be made available for a 30-day comment period.

The EIR will be revised in response to feedback received from I&Aps. All comments received and responses to the comments will be incorporated into the Final Environmental Impact Report (Final EIR), The Final EIR will be made available for a further 30-day commenting period, after which, it will be submitted to DENC for a decision.

Should it be required this process may be adapted depending on input received during the ongoing process and as a result of public input. Both DENC and I&Aps will be informed of any changes in the process.

5.4.3. Interested and Affected Parties

Interested and Affected Parties (I&AP) have been notified by means of advertisement in regional and/or local newspapers, site notices and letters and/or emails to registered I&Aps on the project database.

The updated register of I&Aps is included as **Appendix 5.2.1.**

6. ENVIRONMENTAL ISSUES AND POTENTIAL IMPACTS

Environmental issues were raised through informal discussions with the project team, specialists and authorities. All issues raised will be assessed in the specialist reports and will form part of the Environmental Impact Report. Additional issues raised during the public participation will be listed in the Final Environmental Impact Report.

6.1. LAND USE

The proposed project will be located on communal land owned by the Municipality, and is currently used as grazing for goats by local inhabitants (at least two families). It is a fact that this area has a very low carrying capacity and that the proposed project should result in significant social investment and job creation. However, the families relying on this land for its grazing will have to be given alternative grazing areas or will have to benefit in some other way from this project.

Mitigation should entail, relocating the families onto similar grazing land or compensating them in some other way.

6.2. BIODIVERSITY

A Biodiversity assessment was commissioned to determine if there are any sensitive or endangered vegetation types on the proposed site (Please refer to **Appendix 6.2**). The terms of reference for this study required a baseline analysis of the flora of the area, including the broad ecological characteristics of the site. It must also address the significance of the vegetation in terms of local and national biodiversity targets, ecological corridors and connectivity.

6.2.1. Vegetation

The proposed development will impact on a 150 ha of natural desert vegetation just outside of the Orange River floodplains. One of the main focus points of the biodiversity study was to assess the potential impact on the natural vegetation as well as plant species in terms of their conservation status and remaining extent and to provide impact minimisation recommendations should it be required.

In accordance with the 2006 Vegetation map of South Africa, Lesotho and Swaziland (Mucina & Rutherford, 2006) two broad vegetation types are expected in the vicinity of the proposed development, namely ***Lower Gariep Alluvial Vegetation*** along the Orange river alluvial plain (Blue in Figure 10), and ***Eastern Gariep Rocky Desert*** inland of the alluvial plain. Only ***Eastern Gariep Rocky Desert*** is expected to be impacted by the proposed project (refer to Figure 10). However, **Eastern Gariep Plains Desert** is normally expected in the sheet washed plains between the rocky outcrops covered with Eastern Gariep Rocky Desert vegetation.

According to the *National list of ecosystems that are threatened and in need of protection* (GN 1002, December 2011) these vegetation types are currently classified as follows

Table *: Vegetation status according to the 2004 & 2011 National Spatial Biodiversity Assessment

VEGETATION TYPE	NATIONAL STATUS 2011	REMAINING (2004)	CONSERVATION TARGET	FORMALLY CONSERVED
Lower Gariep Alluvial Vegetation	Endangered	50.3%	31%	5.8%
Eastern Gariep Rocky Desert	Least Threatened	99.7%	34%	-
Eastern Gariep Plains Desert	Least Threatened	Very little intact examples remains	34%	-

However, it is important to note that even though Eastern Gariep Rocky Desert (and Eastern Gariep Plains Desert), is classified as least threatened, it falls within the South African Desert Biome, in this case fringing on the Namibian desert. The Desert Biome is a hyperarid region of great age and one with extraordinary high diversity of organisms (including many endemics) and adaptions. It includes both winter- and summer rainfall areas, making it one of the most interesting hyperarid regions of the world. Compared with other desert regions, plant species richness is very high (especially the Richtersveld) and does not differ much from that of the Succulent Karoo (Mucina & Rutherford, 2006). However, not all parts of this biome are equally rich in species diversity. Plant species richness of the western Gariep Lowland Desert vegetation unit, is thought to be less rich than that of for example the Richtersveld and is described by Mucina & Rutherford (2006) as moderate.

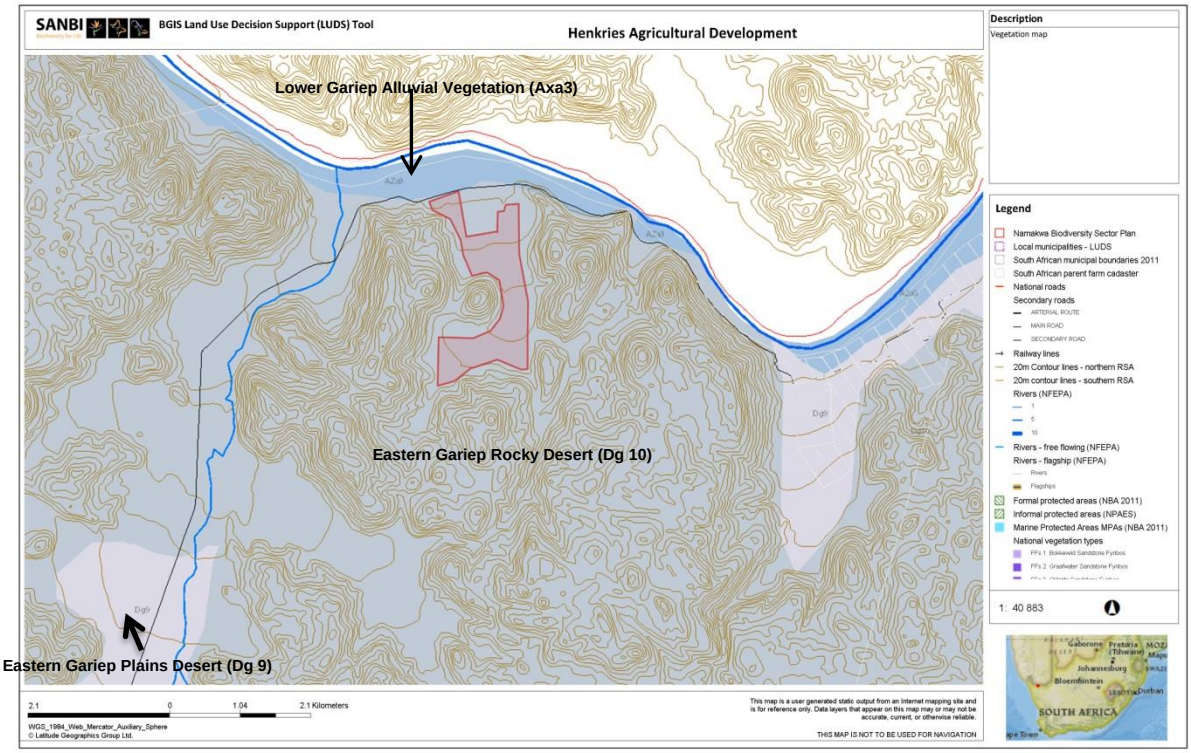

Figure 10: Vegetation map of SA, Lesotho and Swaziland (2006)

6.2.2. Threatened and protected plant species

South Africa has become the first country to fully assess the status of its entire flora. Major threats to the South African flora are identified in terms of the number of plant taxa Red-Listed as threatened with extinction as a result of threats like, habitat loss (e.g. infrastructure development, urban expansion, crop cultivation and mines), invasive alien plant infestation (e.g. outcompeting indigenous plant species), habitat degradation (e.g. overgrazing, inappropriate fire management etc.), unsustainable harvesting, demographic factors, pollution, 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).

  The list of protected tree species is published annually.
- 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).

6.2.2.1. Plants protected in terms of NEM:BA

No species protected in terms of NEM:BA was encountered.

6.2.2.2. Trees protected in terms of NFA

Only one tree species protected in terms of the National Forest Act was encountered, namely *Boscia albitrunca*. Five tree species protected in terms of the National Forest Act, has a potential geografical distribution that overlaps the proposed footprint, of which only 3 are realistically expected in this area. However, in total, only two tree species were encountered on the site, namely *Boscia albitrunca* and *Maerua gilgii.* Both of these species are important in their own right (as any indigenous larger tree should be regarded in any semi-desert or desert area). *Maerua gilgii* is also endemic to this area and has a relative small distribution, but only the *Boscia albitrunca* is protected in terms of the NFA. Sixteen (16) individual *Boscia albitrunca* trees and two (2) *Maerua gilgii* trees were observed within or near to the footprint of the proposed development. Of the sixteen *Boscia* trees, only 7 are directly within the proposed footprint. It should be possible to save all trees on the edge or outside the footprint. Final layout designs should take the locations of these protected trees in consideration, aiming at minimising impact. . Also note that a number of *Euclea pseudebenus* trees were observed along the Henkries – Goodhouse road, as one decent from Henkries towards the Orange River, but none will be affected as part of this development (which is further west).

Where impact with these trees can not be avoided, a license must be applied for and obtianed prior to any distrubance.

6.2.2.3. Plants protected in terms of the NCNCA

Seven plant species protected in terms of the NCNCA was encountered within the proposed footprint.

Details of protected plant species are discussed in the Biodiversity Impact Asessessment (**Appendix 4B)** and key findings are summarised in section 8 of this report.

6.2.3. Critical Biodiversity Areas

The Namakwa District Biodiversity Sector Plan (Desmet & Marsh, 2008) is intended to help guide land-use planning, environmental assessments and authorisations; and, natural resource management in order to promote sustainable development. It has been developed to further the awareness of the unique biodiversity in the area, the value this biodiversity represents to people and promote the management mechanisms that can ensure its protection and sustainable utilisation (Draft Namakwa District Biodiversity Sector Plan, Version 2).

According to the CBA map for the Henkries area (Figure 11 below) it is clear that the proposed site and almost the whole of Henkries are located within proposed CBA 1. It must be noted that this map is not up to date, since all of the already developed areas will then also fall within a CBA 1 area (Refer to the land use maps). Ideally the proposed site should have been placed outside of these CBA areas.

In this case there is no land available at Henkries that will place a development of this size outside of the proposed CBA areas and still within easy access of irrigation.

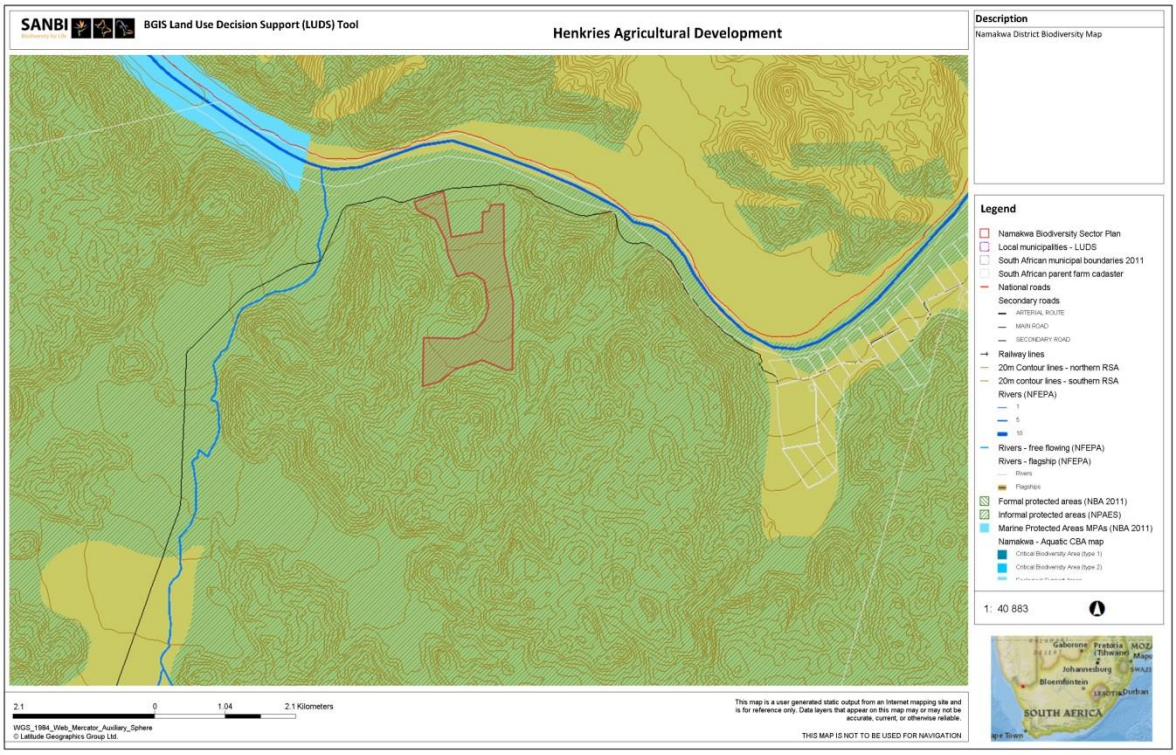

Figure 11: Namakwa District Sector Plan indicating identified CBA area in and around Henkries

6.2.4. Fauna

Although natural fauna and avi-fauna is likely to still be present, it is expected that it would be limited to smaller game, avi-fauna, insects and maybe some reptile's species, because of its proximity to existing agricultural land (and the fact that this property is grazed by at least two families). It is a known fact that many animal and bird species associate with larger indigenous trees such as *Boscia albitrunca* and the removal of mature trees will have an impact on such wildlife (even though very localised). However, because of the current status of the site and the proximity to the Henkries settlement it is not expected that the project will have a significant impact on fauna species. The impact on reptiles will be localised and may result in species being displaced (snakes and lizards) but not significant permanent impact on species is expected.

The proposed development is not expected to have a significant impact on indigenous avi-fauna. The planting of vineyards and date palms, on the other hand, is likely to attract a number of fruit and insect eating bird species (and their predators).

The Biodiversity Impact Assessment is attached as **Appendix 6.2** and key findings are summarised in Section 8 of this report.

6.3. FRESHWATER

No freshwater report was commissioned due to the very low potential impact on freshwater ecosystems (please refer to Paragraph 4.6).

6.4. HERITAGE AND ARCHAEOLOGICAL IMPACTS

In terms of Section 38 of the National Heritage Resources Act (Act No. 25 of 1999) (NHRA), SAHRA require an impact assessment where certain categories of development are proposed. Since the footprint of the proposed development will exceed 5 000 m² and will thus trigger the NHRA. An Archaeological Impact Assessment (AIA) has been commissioned in order to evaluate the possible impacts on heritage or archeologically and to advise SAHRA of the likelihood of impacts on existing heritage as well as recommendations for impact minimisation (if required).

The Heritage Impact assessment is attached as **Appendix 6.3** and key findings are summarised in Section 8 of this report.

6.5. VISUAL IMPACT

The potential impact on the sense of place of the proposed development was also considered. The surrounding area is characterised by agricultural activities. Henkries is in fact almost totally dependent on agriculture for its economic survival. Agricultural practices mainly consist of the production of high value irrigation crops and grazing (however, the grazing potential of the very arid natural veld is very low).

Since the proposed development is very much in character with the existing land use and is not expected to impact negatively on the visual character of the area no visual impact studies was comissioned.

6.6. SOCIO-ECONOMIC IMPACT

The primary objective of the proposed irrigation development project at Henkries centres on economic growth, job creation and economic empowerment. It is on the hand of socio-economic evaluations that this project has proposed and approved by the Department of Agriculture, Land Reform and Urban Development.

The communities of Henkries are characterized by severe poverty and a large proportion of families rely heavily on social grants for subsistence. It is expected that income can be generated through agriculture which will significantly improve the economic situation of the Henkries communities over time (especially focusing on previously disadvantage individuals). Agricultural production will directly contribute to increased employment opportunities for community members and especially the youth. Small business opportunities will also be created in especially the

services industry. The establishment of high value crops in Henkries will create a number of opportunities for schooled and unschooled individuals. Skills development though on-job and formal training will be a high priority in any development initiative. The potential for agro-tourism, agro-processing and value adding initiatives presents further opportunities for diversification of the local economy. It is recognized that successful promotion of agro-processing can impact positively on the incomes of primary producers, create employment and address market risks. It is also one of the means by which transformation of agriculture in the province can be achieved.

6.7. OTHER POTENTIAL ISSUES IDENTIFIED

Any further issues raised during the public participation process or by the Competent Authority not mentioned in this section, will be dealt with during the EIA phase.

7. SPECIALIST STUDIES

Specialist studies were undertaken to provide information to address the concerns and assess the impacts of the proposed development alternatives on the environment.

The specialists are provided with set criteria for undertaking their assessments, to allow for comparative assessment of all issues. These criteria are detailed in the Terms of Reference to each specialist and summarised below.

7.1. CRITERIA FOR SPECIALIST ASSESSMENT

The impacts of the proposed activity on the various components of the receiving environment will be evaluated in terms of duration (time scale), extent (spatial scale), magnitude and significance. These impacts could either be positive or negative.

The magnitude of an impact is a judgment value that rests with the individual assessor while the determination of significance rests on a combination of the criteria for duration, extent and magnitude. Significance thus is also a judgment value made by the individual assessor.

In addition to determining the individual impacts against the various criteria, the element of mitigation, where relevant, will also be brought into the assessment. In such instances the impact will be assessed with a statement on the mitigation measure that could/should be applied. An indication of the certainty of a mitigation measure considered, achieving the end result to the extent indicated, is given on a scale of 1-5 (1 being totally uncertain and 5 being absolutely certain), taking into consideration uncertainties, assumptions and gaps in knowledge.

Table 9: Criteria to be used for impact evaluation

Criteria	Definition
Nature of impact	This is an evaluation of the effect that the construction, operation and maintenance of a proposed development would have on the affected environment. This description should include what is to be affected and how.
Extent	Describe whether the impact will be: local extending only as far as the development site area; or limited to the site and its immediate surroundings; or will have an impact on the region, or will have an impact on a national scale or across international borders.
Duration of the impact	The specialist should indicate whether the lifespan of the impact would be short term (0-5 years), medium term (5-15 years), long terms (16-30 years) or permanent.
Intensity	The specialist should establish whether the impact is destructive or benign and should be qualified as low, medium or high. The specialist study must attempt to quantify the magnitude of the impacts and outline the rationale used.
Probability of occurrence	The specialist should describe the probability of the impact actually occurring and should be described as improbable (low likelihood), probable (distinct possibility), highly probable (most likely) or definite (impact will occur regardless of any prevention measures).
Status of the Impact	The specialist should determine whether the impacts are negative, positive or neutral ("cost – benefit" analysis). The impacts are to be assessed in terms of their effect on the project and the environment. For example, an impact that is positive for the proposed development may be negative for the environment. It is important that this distinction is made in the analysis.
Accumulative Impact	Consideration must be given to the extent of any accumulative impact that may occur due to the proposed development. Such impacts must be evaluated with an assessment of similar developments already in the environment. Such impacts will be either positive or negative, and will be graded as being of negligible, low, medium or high impact.
Degree of Confidence in predictions	The specialist should state what degree of confidence (low, medium or high) is there in the predictions based on the available information and level of knowledge and expertise.
Significance	Based on a synthesis of the information contained in the above-described procedure, the specialist is required to assess the potential impacts in terms of the following significance criteria: **No significance**: the impacts do not influence the proposed development and/or environment in any way. **Low significance**: the impacts will have a minor influence on the proposed development and/or environment. These impacts require some attention to modification of the project design where possible, or alternative mitigation. **Moderate significance**: the impacts will have a moderate influence on the proposed development and/or environment. The impact can be ameliorated by a modification in the project design or implementation of effective mitigation measures. **High significance**: the impacts will have a major influence on the proposed development and/or environment.

7.2. BRIEFS FOR SPECIALIST STUDIES

7.2.1. Soil assessment

BVI consulting engineers did a Soil Impact Assessment of the proposed site – **Appendix 6.1.**

The terms of reference for this study include the following:

- Characterise and map the soils of Henkries and interpret the soil in terms of suitability for irrigation under present climate conditions;
- Evaluate the properties limiting the sustainability of the soils;
- Recommend precautionary measures for sustained irrigation.

7.2.2. Biodiversity assessment

PB Consult undertook the Biodiversity Assessment – **Appendix 6.2**

The terms of reference for this study include the following:

- Complete a Biodiversity Scan of the proposed site in order to determine whether any significant features will be impacted as a result of the proposed development;
- Make recommendations on impact minimisation should it be required;
- Consider short- to long-term implications of impacts on biodiversity and highlight irreversible impacts or irreplaceable loss of species.

7.2.3. Heritage Impact Assessment

Johan Kaplan? Of the Agency of Cultural Resource Management was appointed to compile the Heritage Impact Assessment (HIA) – **Appendix 6.3.**

The terms of reference for the archaeological study were:

- Determine whether there are likely to be any important archaeological sites or remains that might be impacted by the proposed development;
- Identify and map archaeological sites/remains that might be impacted by the proposed development;
- Assess the sensitivity and conservation significance of archaeological sites/remains in the inundation area;
- Assess the status and significance of any impacts resulting from the proposed development, and
- Identify measures to protect any valuable archaeological sites/remains that may exist within the estimated inundation area.

8. ASSESSMENT OF ENVIRONMENTAL IMPACTS

The specialist studies detailed in **Appendix 6** were undertaken to determine significance of the impacts that may arise from the proposed development. The findings of the specialist studies are summarised here. Full copies of the studies are included in **Appendix 6.**

The following studies were undertaken:

8.1. SOIL ASSESSEMENT

The following assessment is based on the findings of the soil study undertaken by BVi Consulting Engineers (Refer to Appendix 6.1).

8.1.1. Key findings

Dundee soil from the Sabie family was the only soil form found in the surveyed area, with a poorly expressed orthic A horizon. The texture is sand with 37 % gravel fragments on average. The gravel is of a variety of sizes. The soil meets the requirements for irrigation. The chemical properties limit the selection of crops which prefer or are insensitive to a high pH.

8.1.2. Impact Assessment

The proposed development will have a direct impact on 150 ha of soils. No special features have been encountered and in terms of geology and soils the site is considered of LOW sensitivity.

8.1.3. Mitigation Measures

- Soil preparation has to include deep (1.2m) ripping lines for grapes or cross ripping lines for dates, to limit the impact of stratification on root growth.
- Irrigation methods are limited to micro or sprinkler irrigation.
- To improve on water efficiency, soil surface should be covered with stones to limit evaporation.
-

8.1.4. Conclusion

The chemical properties limit the selection of crops which prefer or are sensitive to a high pH and elevated salinity. The accumulation of salts in the topsoil and first subsoil is typical of arid climates. The salts can be flushed out of the system and if any doubts exist. The climate limits selection to crops preferring or dependent on extremely high summer temperatures and low humidity. The site is therefore suitable for the production of grapes and dates.

8.2. BIODIVERSITY ASSESSMENT

The following is based on the findings of the biodiversity assessment undertaken by PB Consult (Appendix 6.2).

8.2.1. Key findings

The evaluation of the potential environmental impacts indicates the most significant potential impacts identified where:

- The potential impact on areas identified as critical biodiversity features.
- The potential impact on the grazing rights of the current occupiers of the land (goat farmers).
- The potential impact on a number of *Boscia albitrunca* trees, protected in terms of the NFA, as well as at least on other indigenous tree species.
- The potential impact on plants protected in terms of the NCNCA.

8.2.2. Impact Assessment

The Table 3 underneath gives a summary of the impact assessment findings done by the specialist.

Table 3: Evaluation of impacts (PB Consult)

BIODIVERSITY ASPECT	SHORT DESCRIPTION	SIGNIFICANCE RATING	
Potential impacts on biophysical environment			
Geology & soils (Refer Par. **Error! Reference source not found.**)	A detailed soil study was performed by Digital Soils Africa (3 December 2014). According to this study soils are very similar throughout the study area.	The Dundee soil form covers the whole area, with a poorly expressed orthic A horizon. The texture is sand with 37 % gravel fragments on average. The gravel is of a variety of sizes. Similar soils are expected to cover most of the surroundings and are only broken by alluvial deposits next to the river. The proposed development will have a direct impact on 150 ha of soils. No special features have been encountered and in terms of geology and soils the site is considered of low sensitivity.	
		Without mitigation: Low	**With mitigation: Low**
Land use and cover (Refer Par. **Error! Reference source not found.**)	The proposed footprint will be localised, but will impact on grazing land utilized by at least two families.	The proposed project will be located on communal land owned by the Municipality, and is currently used as grazing for goats by local inhabitants (at least two families). It is a fact that this area has a very low carrying capacity and that the proposed project should result in significant social investment and job creation. However, the families relying on this land for its grazing will have to be given alternative grazing areas or will have to benefit in some other way from this project. Mitigation should entail, relocating the families onto similar grazing land or compensating them in some other way.	
		Without mitigation: High	**With mitigation: Low**
Potential impacts on threatened or protected ecosystems			
Vegetation type(s) (Refer Par. **Error! Reference source not found.** & **Error! Reference source not found.**)	Eastern Gariep Rocky Desert covers the terrain.	The vegetation type is classified as "Least threatened" with approximately 99.7% of this vegetation type remaining. However, at present, none of this vegetation type is formally conserved. Still it is considered highly unlikely that the proposed project will have any significant impacts on local or regional conservation targets. Mitigation: maintain the corridor function of the surrounding rocky desert areas.	
		Without mitigation: Low	**With mitigation: Low**
Conservation priority areas/networks and connectivity.	Namakwa District Biodiversity Sector Plan (Desmet & Marsh, 2008)	According to the CBA map for the Henkries area (**Error! Reference source not found.**) the proposed site and almost the whole of Henkries are located within a proposed CBA 1. Ideally the proposed site should have been placed outside of the proposed CBA. In this case there is no land available at Henkries that will place a development of this size	

BIODIVERSITY ASPECT	SHORT DESCRIPTION	SIGNIFICANCE RATING	
(Refer Par. **Error! R eference source not found.**)		outside of the proposed CBA areas and still within easy access of irrigation. This is also the only and most likely area for any such agricultural development near to the existing agricultural hub. Mitigation: maintain the corridor function of the surrounding rocky desert areas coupled with alien eradication.	
		Without mitigation: Medium	**With mitigation: Low**
Protected plant species (Refer Par. **Error! R eference source not found.**)	Sixteen (16) individuals of Boscia albitrunca (Protected in terms of the NFA) were encountered spread throughout the site. Seven plant species protected in terms of the NCNCA was observed. However, a number of these were common pioneer species from the Aizoaceae family.	Sixteen trees listed in terms of the NFA trees were encountered within the larger site. However, only 7 of these trees are within the proposed footprint and with slight alterations, more of these trees can be safed. Previous experience showed that both Camelthorn and Sheppard's tree have deep root systems, which mean excavation can be done quite close to the tree without impacting on the root system. It is unavoidable that a number of plants protected in terms of the NCNCA will be impacted by the proposed development. However, most of these species are common pioneer species and the impact on the populations of these species will be negligible. Mitigation should entail excellent environmental control, slight layout alterations to avoid as many mature indigenous tree species as possible; good topsoil conservation and rehabilitation practices; and application for permits in terms of the NFA and the NCNCA.	
		Without mitigation: Medium	**With mitigation: Low**
Fauna & Avi-fauna (Refer Par. **Error! R eference source not found.**)	Although natural fauna and avi-fauna is likely to be present, it is expected that it would be limited to small game, avi-fauna, insects and maybe some reptile's species.	Human activity in the area is medium-high and the property is grazed by at least two families. **Mammals**: The site visit showed very little evidence of the presence of game species (e.g. droppings, skeletons etc.) The Henkries area encompasses a very large range of natural veld and it is highly unlikely that the proposed development will have a significant impact on habitat or migration routes. **Reptiles**: The open sandy plains, is not expected to house great numbers of reptile species (limited cover). The surrounding rocky outcrops, on the other hand, will have much more cover and habitat features favoured by a larger variety of reptile species. As a result, the impact on reptiles should be negligible. **Amphibians**: No suitable breeding places were observed on the proposed site and it is highly unlikely that the proposed development will have any significant impact on amphibian species. **Avi-fauna**: The open sandy open plain is likely to provide a habitat for certain bird species as will the small number of full grown indigenous trees that were encountered on site. However, shelter, food and the number of trees and other edibles is a rarity and unlikely to attract bird species in great numbers and the proposed development is not expected to have a significant impact on indigenous avi-fauna. The planting of vineyards and date palms, on the other hand, is likely to attract a number of fruit and insect eating bird species (and their predators). Mitigation should entail minimising the impact on indigenous tree species.	
		Without mitigation: Low	**With mitigation: Low**
Rivers & wetlands (Refer Par. **Error! R eference source not found.**)	No rivers or streams were observed, but a few episodic, non-perennial drainage channels were observed.	The proposed development will be located on an open sheet washed valley floor with a very low gradient within a hyperarid region. Much of this rainfall is experienced in thunder storms. Rainfall can at best be described as episodic or sporadic, and water will only flow for very short periods of time (Non-perennial), with intervals that can vary greatly. As a result the soils will rarely be inundated for longer than a couple of days at a time (if so long). Mitigation will ensure that the development incorporate storm water management (drainage of water during thunderstorm events).	
		Without mitigation: Low	**With mitigation: Low**

BIODIVERSITY ASPECT	SHORT DESCRIPTION	SIGNIFICANCE RATING	
Invasive alien infestation (Refer Par. **Error! R eference source not found.**)	A few *Prosopis* species were observed scattered throughout the property.	At present the infestation is low, but it is vital that the further spreading of this species is stopped. All listed invasive alien species must be removed from the property. However, incorrect alien control methods used for especially *Prosopis* species may aggravate the situation and result in spreading in place of control of these species. Mitigation will entail correct alien control methods coupled with follow up work after rehabilitation.	
		Without mitigation: Low	**With mitigation: Positive**
Potential direct impacts			
Direct impacts	Refers to those impacts with a direct impact on biodiversity features.	The proposed project will have a direct impact on 150 ha of natural vegetation (least threatened), which includes protected plant species. It will have a significant impact on two families utilising the grazing land, and is likely to have a low impact on a very limited number of fauna species, but might result in a positive impact on a number of avi-fauna (attracted by the fruit of the harvest). Impact is considered real, but not substantial. Mitigation will include all the mitigation aspects discussed above.	
		Without mitigation: Medium	**With mitigation: Low**
Potential indirect impacts			
Indirect impacts	Refers to impacts that are not a direct result of the main activity, but are impacts associated or resulting from the main activity.	The proposed project will have indirect impacts like the establishment of temporary lay-down areas, reservoirs, temporary construction sites and concrete mixing areas. However, with good environmental control it will be possible to minimise the impact of such indirect impacts. Mitigation will entail excellent environmental control and rehabilitation in accordance with approved management plans, placement of temporary lay-down areas or construction sites within areas that are not environmentally sensitive and will not impact on protected plant species. It will also entail good waste and wastewater control.	
		Without mitigation: Medium	**With mitigation: Low**
Potential cumulative impacts			
Cumulative impacts	Refers to the cumulative loss of ecological function and other biodiversity features on a regional basis.	The proposed project will have a permanent but localised impact. However, it is considered unlikely that the cumulative impact will result in significant additional impact on local or regional biodiversity targets, but it will have a localised impact on protected plant species and on the grazing rights of at least two families (although carrying capacity is very low). Mitigation will entail excellent environmental control and all of the mitigation measures addressed above.	
		Without mitigation: Medium	**With mitigation: Low**
The No-Go Option			
The No-Go Option	The "No-Go alternative" does not signify significant biodiversity gain or loss especially on a regional basis.	The loss of full grown protected tree species, the potential impact on natural fauna and the potential impact on land-use and grazing rights will be negated. However, it will prevent a considerable socio-economic investment and job creation. One of the main issues of this area being very limited job opportunities. The no-go option will mean that these potential economic gains will be lost to the province.	

8.2.3. Mitigation Measures

- 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 qualified Environmental Control Officer (ECO) must be appointed to monitor the construction phase in terms of the EMP as well as any other conditions which might be required by the Department of Environmental Affairs.
- Current land users (occupiers) must be notified of the proposed project and must be suitably compensated.
- An integrated waste management system must be implemented during the construction phase. All rubble and rubbish (if applicable) must be collected and removed from the site to a Municipal approved waste disposal site.
- All alien vegetation should be removed from the larger footprint and its immediate surroundings.
- All efforts must be made to minimise impact on mature indigenous trees within the final footprint (especially protected species).
- Permits must be obtained for the removal of any protected species which might be encountered.
- Topsoil must be removed (the top 15-20 cm of soil) from all laydown- and/or construction related sites outside of the agricultural footprint. All such areas must be re-instated/rehabilitated on completion of the project. Topsoil must be protected and stored separately during the construction phase for rehabilitation purposes. Rehabilitation must commence as soon as possible after such sites are not used anymore.

8.2.4. Conclusion

However, with appropriate mitigation it is considered highly unlikely that the proposed project 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 development and operational activities.
- Loss of local biodiversity and threatened plant species.
- Loss of ecosystem connectivity

Lastly it is felt that good environmental planning and control during development planning, the appointment of a suitably qualified ECO and the implementation of an approved EMP, could significantly reduce environmental impact.

With the available information to the author's disposal it is recommended that project be approved since it is not associated with significant environmental impact, provided that mitigation is adequately addressed.

8.3. HERITAGE ASSESSMENT

The Agency of Cultural Resource Management was appointed to conduct a Heritage Impact Assessment (HIA) (Appendix 6.3). The following is based on the findings of this HIA.

8.3.1. Key findings

- Only a very small number of Later Stone Age flakes tools were recorded. No old buildings, structures or features are present in the application area.
- The remains of a small (modern) kraal, and a possible grave were recorded about 20m south of a large sandstone outcrop in the north western corner of the proposed development site.

8.3.2. Impact Assessment

- ”Very small numbers” mean that the archaeological remains have been graded as having *Low* (Grade 3C) significance.

- A grave may be impacted by proposed farming activities. Burials are rated as having *Moderate-High* (Grade 3B) significance.

- According to the SAHRIS paleo-sensitivity map, the area is considered to have a very low (insignificant/zero) paleontological sensitivity. The impact significance of the proposed development as far as paleontological heritage resources are concerned is assessed as LOW.

8.3.3. Mitigation measures

With regards to the proposed agricultural development on the Remainder of Farm Steinkopf No. 22 near Henkries, the following recommendations are made: -

- No archaeological mitigation is required.
- The grave (Site 665) must be fenced off prior to site preparation commencing. Alternatively a buffer of 30m must be established around the site, which includes the modern kraal (Site 664).
- Should any (other) human remains be uncovered or found during agricultural operations these must be immediately reported to the South African Heritage Resources Agency (Ms Natasha Higgit 021 462 4502), or Jonathan Kaplan (082 321 0172).

8.3.4. Conclusion

The HIA has identified no significant impacts to pre-colonial archaeological material that will need to be mitigated prior to, proposed farming activities commencing.

Therefore, there are no objections to the authorization of the proposed development. The possible grave (Site 665) must be protected during the Operational Phase of the project.

9. SUMMARY OF IMPACTS

Table 9 is a summary of all the impacts that are associated with the construction and operational phase for the preferred development as per the specialist assessments.

Table 9 summary of all impacts from specialist impact ratings

Study	Impact	Significance No mitigation	Significance With Mitigation
Soil	Geology and soil	Low Negative Impact	Low (Negative Impact)
Biodiversity	Land use and cover	High (Negative Impact)	Low (Negative Impact)
	Vegetation types	Low (Negative Impact)	Low (Negative Impact)
	Corridors and conservation priority areas/networks	Medium (Negative Impact)	Low (Negative Impact)
	Protected plant species (Flora)	Medium (Negative Impact)	Low (Negative Impact)
	Fauna and avi-fauna	Medium (Negative Impact)	Low (Negative Impact)
	Rivers and wetlands	Low (Negative Impact)	Low (Negative Impact
	Invasive alien infestation	Low (Negative Impact)	Positive
Heritage	Loss of archaeological heritage	Low (Negative Impact)	Low (Negative Impact)

9.1. IMPACT RATING DONE BY EAP

10. RECOMMENDATIONS

The following mitigation measures must be enforced if the proposed development were approved. These are also included in the Environmental Management Programme (**Appendix 7**).

10.1. CONSTRUCTION PHASE

- 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 qualified Environmental Control Officer (ECO) must be appointed to monitor the construction phase in terms of the EMP as well as any other conditions which might be required by the Department of Environmental Affairs.
- Current land users (occupiers) must be notified of the proposed project and must be suitably compensated.
- An integrated waste management system must be implemented during the construction phase. All rubble and rubbish (if applicable) must be collected and removed from the site to a Municipal approved waste disposal site.
- All alien vegetation should be removed from the larger footprint and its immediate surroundings.
- All efforts must be made to minimise impact on mature indigenous trees within the final footprint (especially protected species).
- The necessary permits (NFA and NCNCA) must be obtained for the removal of any protected species which might be encountered.
- Topsoil must be removed (the top 15-20 cm of soil) from all laydown- and/or construction related sites outside of the agricultural footprint. Topsoil must be protected and stored separately during the construction phase for rehabilitation purposes. Rehabilitation must commence as soon as possible after such sites are not used anymore.
- All such areas must be re-instated/rehabilitated on completion of the project.
- No archaeological mitigation is required.
- The grave (Site 665) must be fenced off prior to site preparation commencing. Alternatively a buffer of 30m must be established around the site, which includes the modern kraal (Site 664).
- Should any (other) human remains be uncovered or found during agricultural operations these must be immediately reported to the South African Heritage Resources Agency (Ms Natasha Higgit 021 462 4502), or Jonathan Kaplan (082 321 0172).

10.2. MAINTENANCE AND MANAGEMENT

- Irrigation methods must be limited to micro or drip irrigation in order to ensure efficient irrigation practices and minimum water loss (which relates to less pump costs and thus less energy used).
- To improve on water efficiency, soil surface should be covered with stones to limit evaporation.

11. CONCLUSIONS

The following specialist studies were undertaken as part of the Environmental Impact Assessment:

- Soil Report
- Biodiversity Impact Assessment
- Heritage Impact Assessment

The specialist studies and the information provided within the EIA Report indicate that the proposed Henkries Mega-Agri Park Development does not pose any significant impacts and can be implemented with appropriate mitigation.

TThere is a definite need, locally and nationally, for economic development and the creation of employment opportunities. In the Nama Khoi Municipality, the most viable formal development option, which will also relates to the most employment opportunities remains agriculture.

In terms of Alternatives, the land under consideration (and the whole of Henkries mond), forms part of the Steinkopf Commonage (Farm Steinkopf No. 22), which is owned by the municipality and does not require to be procured in the open market. It also includes all of Henkries and its surrounding areas (293 405 ha in size), and as such there is no property alternatives at Henkries mond area. Alternative 1 is the preferred layout alternative due to the favourable soil type, topography and proximity to existing infrastructure.

The "no-go" option, which is the option of not investing in this development (expanding agricultural land), will mean that none of the potential environmental impacts will be triggered. However, it will also mean that none of the direct or indirect socio-economic benefits of the proposed development will be realised, which will remain to impact negatively on a province already struggling with high unemployment rates and poor socio-economic prospects.

The proposed development can be defined as unique agricultural land due to specific combinations of location, climate or soil properties that make the area highly suitable for a specific crop, more specifically dates and grapes.

From a biodiversity perspective, with the good environmental control and mitigation measures in place, the proposed project should not have any significant impact on conservation targets.

The Heritage Impact Assessment indicates no objections to the authorisation of the proposed agri-development. Measures must be put in place to protect a grave site, but other than that there are no significant impacts on pre-colonial archaeological material that will need to be mitigated prior to the proposed development.

Considering all the information, it is not envisaged that this proposed Henkries Mega-Agri Park development will have not a significant negative impact on the receiving environment, and the socio-economic benefits are expected to greatly outweigh any negative impacts.

It is therefore recommended that the proposed new Mega-Agri Park (Alternative 1) be supported and be authorised with the necessary conditions of approval, subject to the implementation of the recommended enhancement and mitigation measures contained in Section 10.

12. EXPERTISE OF THE EAP

This Environmental Impact Report for comment was prepared by Me Inge Erasmus under supervision of Mr Peet Botes.

Inge completed her BA Honours Degree in Geography and Environmental Studies at Stellenbosch University in 2016. Before completing her honours degree Inge gained practical experience as a junior environmental consultant at Hatch Goba in Johannesburg from 2014 until 2015. Inge acted as an environmental control officer on a variety of projects in the Northern Cape, conducting environmental compliance audits, as well as being part of a project team working on a major resettlement project for Kumba Iron ore. Inge joined Enviro Africa in February 2017, generally performing duties as an environmental assessment practitioner with regards to NEMA EIA applications.

Mr. Botes holds a BSc. (Hons.) degree in Plant Ecology from the University of Stellenbosch (Nature Conservation III & IV as extra subjects). He has been employed for more than 20 years in the environmental management field, first at the Overberg Test Range (a Division of Denel) managing the environmental department of OTB and being responsible for developing and implementing an ISO14001 environmental management system, ensuring environmental compliance, performing environmental risk assessments with regards to missile tests and planning the management of the 26 000 ha of natural veld, working closely with CapeNature (De Hoop Nature Reserve). In 2005 he joined Enviroscientific, an independent environmental consultancy specializing in wastewater management, botanical assessments and developing environmental management plans and strategies, environmental control work as well as doing environmental compliance audits. He was also responsible for helping develop the biodiversity section of the Farming for the Future audit system implemented by Woolworths. During his time with Enviroscientific he performed more than 400 biodiversity and environmental legal compliance audits. He is currently employed by EnviroAfrica. Experience with EnviroAfrica includes NEMA applications, biodiversity- and botanical assessments, environmental compliance audits and environmental control work.

Mr. Botes is also a registered Professional Botanical, Environmental and Ecological Scientists at SACNASP (South African Council for Natural Scientific Professions) as required in terms of Section 18(1)(a) of the Natural Scientific Professions Act, 2003, since 2005.

(----------END----------)

Appendix 1. Location- & biodiversity overlays maps

Appendix 2. Site plans

Appendix 3. Site photographs

Appendix 4. Additional information

Draft Henkries Development Plan, 31July 2015

Appendix 5. Public participation

5.1 INITIAL PPP

5.1.1 I&AP'S REGISTER

5.1.2 PROOF OF NEWSPAPER ADVERTISEMENT

5.1.3 INITIAL NOTIFICATION LETTERS

5.1.4 PROOF OF POSTERS AND LETTER DROPS

5.1.5 PROOF OF LANDOWNER NOTIFICATION

5.1.6 COMMENTS RECEIVED (INITIAL PPP)

- NONE

5.1.7 COMMENTS AND RESPONSE REPORT (INITIAL PPP)

5.2 PPP ON SCOPING REPORT

5.2.1 I&AP'S REGISTER (UPDATED)

5.2.2 PROOF OF SCOPING REPORT PPP

5.2.3 COMMENTS RECEIVED

- 5.2.3.1 DENC ACCEPTANCE OF SCOPING
- 5.2.3.2 COMMENTS FROM DAFF
- 5.2.3.3 COMMENTS FROM DWS
- 5.2.3.4 RESPONSE FROM BVI ON WATER USE RIGHTS
- 5.2.3.5 COMMENTS FROM SAHRA

5.2.4 COMMENTS AND RESPONSE REPORT (UPDATED)

Appendix 6. Specialist Studies

Appendix 7. Environmental Management Plan

Appendix 8. CURRICULUM VITAE OF EAP