Monechma genistifolium subsp. *australe, Geigeria* sp. *Boscia albitrunca* is one of the few tall shrubs within this vegetation unit.

The Open shrub plains occupy the majority of the Study Area, with high shrubs and scattered trees on deep sandy, red soils or gravel plains and a well- developed herbaceous layer. The species diversity is relatively low, and includes taller woody species such as *Senegalia mellifera, Parkinsonia africana, Grewia flava and Boscia albitrunca*. Scattered individuals of *Vachellia erioloba* are also present within the landscape. Low shrubs include *Lebeckia linearifolia, Lycium bosciifolium, Rhigozum trichotomum* and *Salsola etoshensis*. Conspicuous grass species include *Schmidtia kalahariensis, Eragrostis lehmanniana* and *Stipagrostis ciliata*.

Figure 2 Map of the vegetation community distribution across the site

The open shrub duneveld within the Gordonia Duneveld vegetation type is characterised by the presence of low dunes with crests, slopes and streets, the vegetation composition largely conforms to an open tree savanna. Prominent woody species include *Vachellia haematoxylon, Parkinsonia africana, Rhigozum trichotomum, Boscia albitrunca* and *Vachellia erioloba*. Besides *Schmidtia kalahariensis*, the grass layer is characterised by *Eragrostis lehmanniana, Centropodia glauca, Stipagrostis amabilis, Brachiaria glomerata Stipagrostis obtusa* and *S. ciliata*.

Figure 3 Examples of the calcareous low shrub (left) and open shrub plains (right)

2.2 Species Counts

In terms of the protected trees present, the site is dominated by *Boscia albitrunca*, it occurs uniformly throughout most of the site at just under 3 trees per Ha, it is only in the duneveld where the presence of the *Boscia albitrunca* are visible less. Although occasional individuals of the *Vachellia erioloba* are found within the calcareous low shrubland, these trees occur with more frequency in the open shrub plains and the duneveld. The *Vachellia haematoxylon* is largely restricted to the open shrub duneveld.

The other SCC mostly occur within the calcareous low shrubland. Figure 3 provides a visual representation of SCC within the calcareous low shrubland, which demonstrates the restriction of their range across the site. The exception was the *Hoodia gordonii* which was also found in the open shrub plains, this species has a wide tolerance of growing habitats, as it can be found in deep Kalahari sands, as well as on dry stony flats.

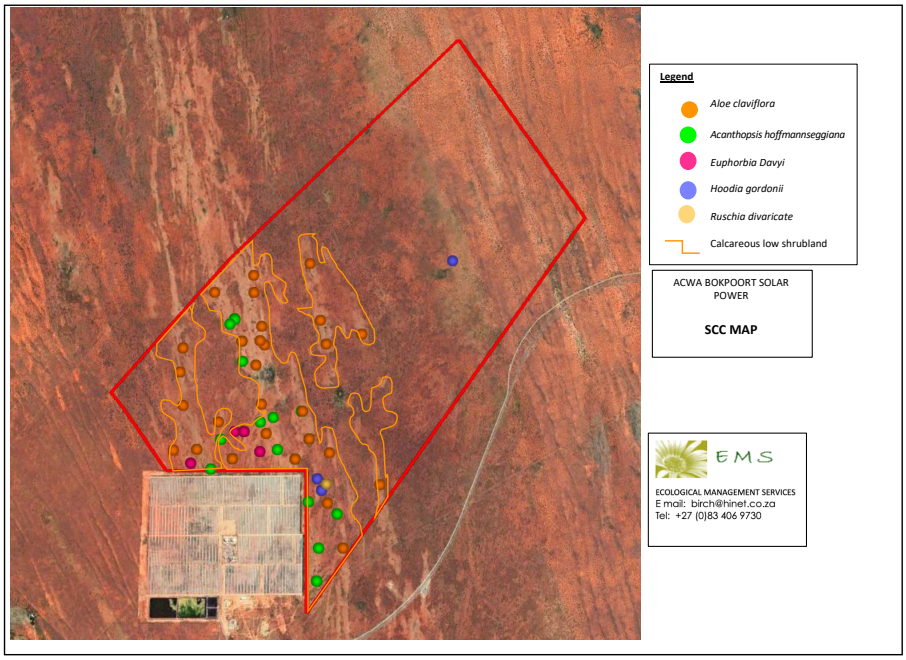

Figure 4 Visual representation of the distribution of some of the SCC within the calcareous low shrubland[1].

[1] Note: Not all SCC present on site are shown on the map. Markers represent single individuals as well as clusters of SCC

Species	Status	Permit applicable Legislation	Population Count
Boscia albitrunca	LC Protected	National Forests Act 1998 NCNCA schedule 2	4350
Vachellia erioloba	LC Protected	National Forests Act 1998	394
Vachellia haematoxylon	LC Protected	National Forests Act 1998	653
Aloe claviflora	LC Protected	NCNCA schedule 2	552
Acanthopsis hoffmannseggiana	DDT	NA	2607
Euphorbia Davyi	LC Protected	NCNCA schedule 2	5
Hoodia gordonii	DDT Protected	NCNCA schedule 1 TOPS Protected schedule B1	4
Ruschia divaricata	LC Protected	NCNCA schedule 2	252

Table 1: Summary of the species of conservation concern that were located during the walk through survey

The development will result in the loss of a substantial amount of *Boscia albitrunca* trees. The property has in the past been extensively farmed, the large "monostands" of *Schmidtia kalahariensis* across the site indicates over utilisation. The population of *Boscia albitrunca* further attest to heavy utilisation, as a large number of trees across the property show damage from over utilisation. There were no tall *Boscia albitrunca* trees on the property most were singled stemmed 2-3m shrubs with more than 15% of the population showing damage from utilisation, with some coppicing from badly damaged individuals. The population on site did not show a significant amount of young plants, indicting low recruitment and therefore population decline, however Marais (2019)[2] states that the persistence of *B. albitrunca* populations may be more reliant on the long-lived nature of this species than on the success of recruitment events, so this alone does not indicate whether or not the population on site is declining. More information on the population structure would be required to adequately determine population trends on site.

[2] Marais, K. 2019. The effect of equid bark stripping on *Boscia albitrunca* populations. Dissertation submitted in fulfilment of the requirements for the degree Master of Science in Environmental Sciences at the North-West University

3 DISCUSSION & RECOMMENDATIONS

Alias and Milton (2003)[3] described *B. albitrunca* as a keystone species, which is important considering populations of this species are under increasing herbivory pressure due to its rather unique function of providing evergreen foliage in these dry areas. Not only is *B. albitrunca* a preferred browse species to wild herbivores, but it is also favoured by domesticated livestock, which seem to have a preference for its nutritious bark when other forage resources are limited.

Large *Vachellia erioloba* trees are important as nesting and as perching sites but the groups of smaller trees provide a unique habitat acting as a nursery for other plant species and creating important habitats for faunal species. These trees are also regarded as keystone species and are thought to act as nutrient pumps but it is equally likely that they are providing water to shallower-rooted plants via hydraulic lift. The *Vachellia haematoxylon* has a very narrow distribution range and it's not well protected (its distribution is shown below in green). Although these tree species are all listed as Least Concerned on the South Africa Red List of Plants (SANBI 2017), they are protected under the National Forests Act (Act 84 of 2998) (Protected Tree list of 2014), and therefore require permits prior to removal.

The criteria used to select tree species for inclusion in the protected tree list are:

- Red List Status (rare or threatened species);
- Keystone Species Value (whether species play a dominant role in an ecosystem's functioning);
- Sustainability of Use (whether a species is threatened by heavy use of its products such as timber, bark etc);
- Cultural or Spiritual Importance (outstanding landscape value or spiritual meaning attached to certain tree species); and
- Other Legislation (whether a species is already adequately protected by other legislation).

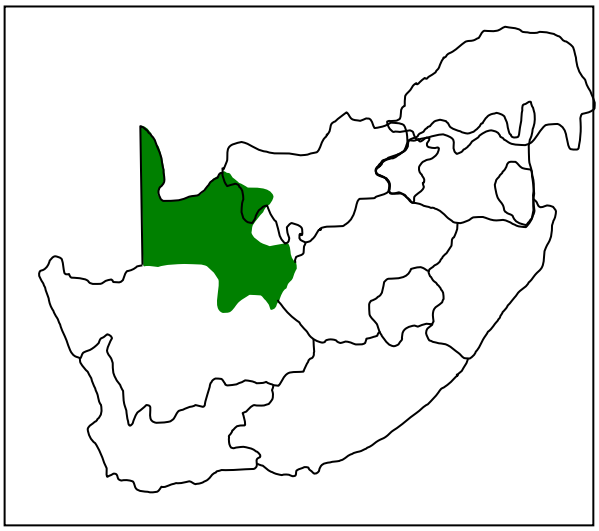

Figure 5 The distribution range of *Vachellia haematoxylon*.

[3] Alias, D. & Milton, S. 2003. A collation and overview of research information on *Boscia albitrunca* (Sheperd's Tree) and identification of relevant research gaps to inform protection of the species. Department of Water Affairs and Forestry. Contract No 2003/089.

It is not practical or feasible to remove and relocate these tree species, thus all trees within the development footprint will be removed and destroyed. The plant communities in which the protected trees occur are well represented in the immediate surrounds and these species seem to occur with the same density and vigour in the surrounding communities, thus indicating that the loss from site would not result in a loss of the species from the immediate area, however it would result in a reduction in local population size.

With respect to the other SCC that occur on site, which are mostly restricted to the calcareous low shrubland. These species could be rescued and relocated to surrounding areas. They could also be used as part of the project's rehabilitation plan, particularly if they can be temporarily housed during the construction phase, thereby reducing the total number of plants that would be lost from site.

With respect to relocation it's very important that the relocation sites are thoroughly investigated, to prevent the relocation sites being disturbed through the artificial addition of plant species. It's not practical to assume that all the species can be rescued and relocated particularly where large amounts of plants are present, such as the in the case of the *Acanthopsis hoffmannseggiana* and the *Aloe claviflora,* under these circumstances its best to try and rescue what is practical. These species are well represented in the surrounding area thus indicating that the loss from site would not result in a loss of the species from the immediate area. The *Euphobia davyi* and *Hoodia gordonia* should be removed and relocated.

3.1 Permitting requirements

In the Northern Cape, environmental permitting is regulated through a central integrated permit office managed by DENC which regulates both national and provincial requirements. As such an integrated permit application is required for the development. In addition to this application a separate application form in terms of the Foresty Act (Act 84 of 1998) for the protected trees, *Vachellia erioloba*, *Vachellia haematoxylon* and *Boscia albitrunca* should be completed, and submitted.

APPENDIX 1: Sample site locations

NO	Co-ordinates
1	21.99888888888889,-28.70694444444444
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Annexure D:
Chance Find Protocol

<table>
<tr><td colspan="3">Appendix 1: CHANCE FOSSIL FINDS PROCEDURE: BOKPOORT II SOLAR POWER FACILITY ON THE REMAINING EXTENT OF FARM BOKPOORT 390 NEAR GROBLERSHOOP</td></tr>
<tr><td>Province & region:</td><td colspan="2">Northern Cape, ZF Mgcawu District Municipality.</td></tr>
<tr><td>Responsible Heritage Management Agency</td><td colspan="2">SAHRA, 111 Harrington Street, Cape Town. PO Box 4637, Cape Town 8000, South Africa.
Phone: +27 (0)21 462 4502. Fax: +27 (0)21 462 4509. Web: www.sahra.org.za</td></tr>
<tr><td>Rock unit(s)</td><td colspan="2">Precambrian Namaqua-Natal basement rocks. Kalahari Group aeolian sands, calcretes, Late Caenozoic alluvium.</td></tr>
<tr><td>Potential fossils</td><td colspan="2">Mammalian bones, teeth and horn cores, freshwater molluscs, trace fossils in older alluvial deposits, calcrete hardpans.</td></tr>
<tr><td rowspan="5">ECO protocol</td><td colspan="2">1. Once alerted to fossil occurrence(s): alert site foreman, stop work in area immediately (N.B. safety first!), safeguard site with security tape / fence / sand bags if necessary.</td></tr>
<tr><td colspan="2">2. Record key data while fossil remains are still in situ:
Accurate geographic location – describe and mark on site map / 1: 50 000 map / satellite image / aerial photo
Context – describe position of fossils within stratigraphy (rock layering), depth below surface
Photograph fossil(s) in situ with scale, from different angles, including images showing context (e.g. rock layering)</td></tr>
<tr><td>3. If feasible to leave fossils in situ:
Alert Heritage Resources Agency and project palaeontologist (if any) who will advise on any necessary mitigation
Ensure fossil site remains safeguarded until clearance is given by the Heritage Resources Agency for work to resume</td><td>3. If not feasible to leave fossils in situ (emergency procedure only):
Carefully remove fossils, as far as possible still enclosed within the original sedimentary matrix (e.g. entire block of fossiliferous rock)
Photograph fossils against a plain, level background, with scale
Carefully wrap fossils in several layers of newspaper / tissue paper / plastic bags
Safeguard fossils together with locality and collection data (including collector and date) in a box in a safe place for examination by a palaeontologist
Alert Heritage Resources Agency and project palaeontologist (if any) who will advise on any necessary mitigation</td></tr>
<tr><td colspan="2">4. If required by Heritage Resources Agency, ensure that a suitably-qualified specialist palaeontologist is appointed as soon as possible by the developer.</td></tr>
<tr><td colspan="2">5. Implement any further mitigation measures proposed by the palaeontologist and Heritage Resources Agency</td></tr>
<tr><td>Specialist palaeontologist</td><td colspan="2">Record, describe and judiciously sample fossil remains together with relevant contextual data (stratigraphy / sedimentology / taphonomy). Ensure that fossils are curated in an approved repository (e.g. museum / university / Council for Geoscience collection) together with full collection data. Submit Palaeontological Mitigation report to Heritage Resources Agency. Adhere to best international practice for palaeontological fieldwork and Heritage Resources Agency minimum standards.</td></tr>
</table>

Appendix F:
Public Participation Report

REPORT

Basic Assessment for the Development of two 9.9MW Internal Combustion Engines associated with the previously authorised Afrikaans and Sotho Photovoltaic (PV) Plant on the Remaining Extent of the Farm Bokpoort 390 near Groblershoop within the !Kheis Local Municipality in the Northern Cape Province.

Public Participation Summary Report

Client: ACWA Power Project DAO

Reference: MD4195-RHD-ZZ-XX-RP-Z-0001

Status: S0/P01.01

Date: 21 April 2022

Royal HaskoningDHV
Enhancing Society Together

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Document title:	Basic Assessment for the Development of two 9.9MW Internal Combustion Engines associated with the previously authorised Afrikaans and Sotho Photovoltaic (PV) Plant on the Remaining Extent of the Farm Bokpoort 390 near Groblershoop within the !Kheis Local Municipality in the Northern Cape Province.
Document short title:	
Reference:	MD4195-RHD-ZZ-XX-RP-Z-0001
Status:	P01.01/S0
Date:	21 April 2022
Project name:	The Development of two 9.9MW Internal Combustion Engines associated with the previously authorised Afrikaans and Sotho Photovoltaic (PV) Plant
Project number:	MD4195
Author(s):	Seshni Govender

Drafted by:	Seshni Govender
Checked by:	Prashika Reddy
Date:	22.04.2022
Approved by:	Prashika Reddy
Date:	22.04.2022

Classification
Project related

Royal HaskoningDHV

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Appendices

1 Introduction

In September 2020, the Department of Mineral Resources and Energy (DMRE) released a request for proposal as part of the Risk Mitigation Independent Power Producer Procurement Programme to reduce the current load shedding periods being experienced by the country. In responding to the request, ACWA Power Project DAO (RF) Pty Ltd (hereafter referred to as ACWA Power) submitted a bid for a 150MW (export capacity) PV plant that was bid as “Project DAO” and were successful. Project DAO has been classified as a Strategic Integrated Project on the 01 April 2021 under Project Number: RM-TA-0025-001 in terms of Schedule 2 (Section 17(2)) of the Infrastructure Development Act (Act No. 23 of 2014).

A condition in the RFP requires Bidders to not tap into the national grid for power and requires that a reliability test be undertaken at a specified generation rate and time. In meeting the RFP requirements, ACWA Power decided to supplement their already authorised project infrastructure by adding ICE infrastructure in the projects to be bid and were issued with Environmental Authorisations (EAs) in May 2021 for the following:

- Zulu ICE (Ref 14/12/16/3/3/1/2295);
- Venda ICE ((Ref 14/12/16/3/3/1/2296);
- Swati ICE ((Ref 14/12/16/3/3/1/2297);
- Sotho ICE (Ref 14/12/16/3/3/1/2298);
- Pedi ICE (Ref 14/12/16/3/3/1/2299);
- Ndebele ICE (Ref 14/12/16/3/3/1/2300); and
- Afrikaans ICE (Ref 14/12/16/3/3/1/2301).

The DMRE amended the reliability run requirements, and ACWA Power decided to lapse four (Zulu, Afrikaans, Sotho and Swati PV plant ICE) of the seven ICE EAs.

The DMRE has now confirmed that they are not amending the reliability run requirements, and as such, ACWA Power needs two additional ICE to meet these requirements. Individual applications for Environmental Authorisation will be lodged for the 9.9MW ICE within the Afrikaans and Sotho previously approved PV plants on the Bokpoort Farm, however, this Basic Assessment (BA) study is applicable to the entire development of the two individual ICE. The proposed positions of the ICE were planned taking into account the layout of other approved infrastructure e.g. PV plants and access routes, which will have to undergo an amendment process. Each of the ICEs will be subject to its own application for Environmental Authorisation.

The specifications for each of the ICE associated with the Afrikaans and Sotho PV Plant are provided below:

- Generating capacity: 9.9 MW
- Fuel Type: Diesel
- Stack height: 5.8 m
- Number of engines for the ICE: Afrikaans: 11 engines; Sotho: 12 engines
- Fuel storage tanks: Afrikaans: 2 x 71.6m^3 and 1 x 35.3m^3; Sotho: 2 x 71.6m^3 and 1 x 35.3m^3
- Fuel volume: Combined capacity of less than 500 m^3 per ICE plant
- Water requirements: water for cooling which falls within the already assessed threshold i.e. 22 000m^3
- Area size: 1.5ha (cumulative extent of 1ha with a 0.5ha actual development footprint per ICE)

1.1 Public Participation Process

Public Participation (PP) is a process that is designed to enable all interested and affected parties (I&APs) to voice their opinion and/or concerns which enables the practitioner to evaluate all aspects of the proposed development, with the objective of improving the project by maximising its benefits while minimising its adverse effects.

The PP Process must adhere to the requirements of Regulations 39 - 44 (GNR 982) as amended. Further, a PP guideline in terms of NEMA was issued by the Department of Forestry, Fisheries and the Environment (DFFE) in 2017, of which provisions will also be implemented.

The PP Process for proposed project will be undertaken according to the stages outlined below as well as the requirements for the stakeholders.

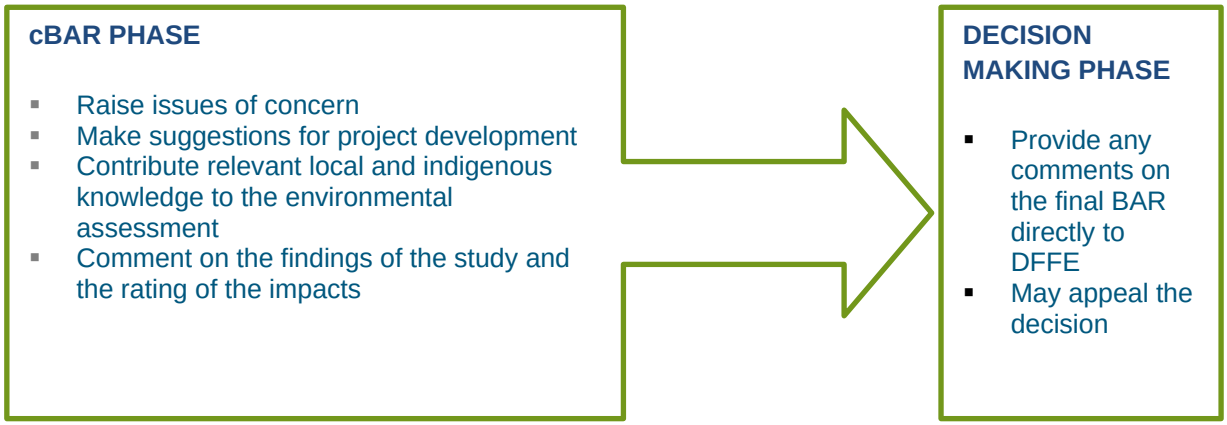


Figure 1-1: Responsibilities of I&APs

1.2 Purpose of the Report

The key purpose of this PP Summary Report is to:

- Summarise the PP Process undertaken for the BA study;
- Highlight what has been done to date;
- Synthesise the issues and concerns identified by I&APs and various stakeholders during the PP Process; and
- Synthesise comments on the proposed development.

1.3 Terms of Reference for Public Participation

The terms of reference for the implementation of a successful and robust PP Process, were as follows:

- Identification of I&APs in the vicinity of the study area;
- Provision to all I&APs of an opportunity to comment or raise concerns regarding the project;
- Maintenance of procedures for communication with I&APs and receiving, documenting and responding to relevant communication from I&APs;
- Identification and elimination of any sources of misunderstandings between the Applicant, EAP and the I&APs;
- Always aim to improve the communication between the Applicant, EAP and I&APs;

- Present the project in an objective way by supplying all appropriate, relevant and accurate information and facts in an unbiased manner to ensure a better understanding of the proposed project; and
- Ensure that the PP Process is an independent and transparent process.

1.4 Public Participation Summary

The PP Process commenced in November 2021 where a Notification Document was distributed to the I&APs as well as commenting authorities. I&APs were introduced to the project and encouraged to register on the database.

Site notices were erected at strategic locations around the study area on 25 November 2021.

An advertisement was placed in the Gemsbok Newspaper on 8 December 2021 followed by an initial commenting period 14 December 2021 – 04 February 2022, which provided an opportunity for the I&APs to raise their issues and concerns regarding the proposed activity. A second 30 day review period will also be conducted for I&APs to raise their issues and concerns regarding the updated information provided from 03 May 2022 - 01 June 2022, an advert will be placed in the Gemsbok Newspaper on the 27 April 2022.

2 Approval of Public Participation Plan

As per Government Gazette 43412 GN R. 650 Disaster Management Act (57/2002): Directions Regarding Measures to Address, Prevent and Combat the Spread of COVID-19 Relating to National Environmental Management Permits and Licences: Annexure 2 and 3 published on 5 June 2020, the DFFE requires a Public Participation (PP) Plan to be approved for an application for Environmental Authorisation that requires public participation. The PP Plan was submitted to the department and subsequently approved on 04 November 2021 (**Appendix A**). The Disaster Management Act has since been revised.

3 Identification of I&APs

An Interested &Affected Party database (I&AP) is already available due to previous projects undertaken on the same property. The I&AP database will be updated with new I&APs requesting to be registered and will be maintained throughout the project.

4 Site Notices

The NEMA EIA Regulations 2014 (as amended) require that a site notice be fixed at a place conspicuous to the public at the boundary or on the fence of the site where the activity to which the application relates is to be undertaken and on any alternative sites. The purpose of this is to notify the public of the project and to invite the public to register as stakeholders and inform them of the PP Process. Royal HaskoningDHV erected site notices at various noticeable locations around the perimeter of the site and at strategic locations on or near the site (Boegoeberg Service Centre, Sterhnam Service Centre,Wegdraai Service Centre and Groblershoop Central Business District).

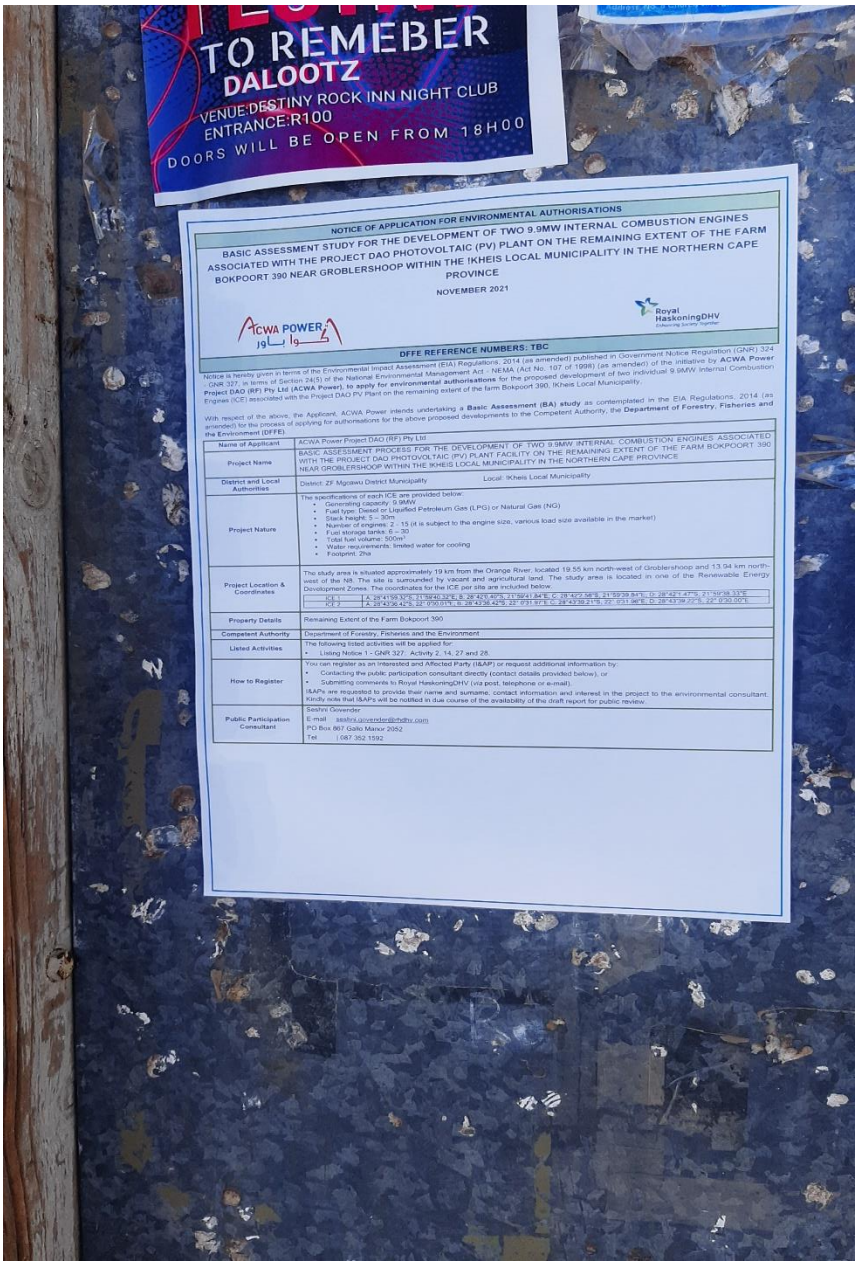
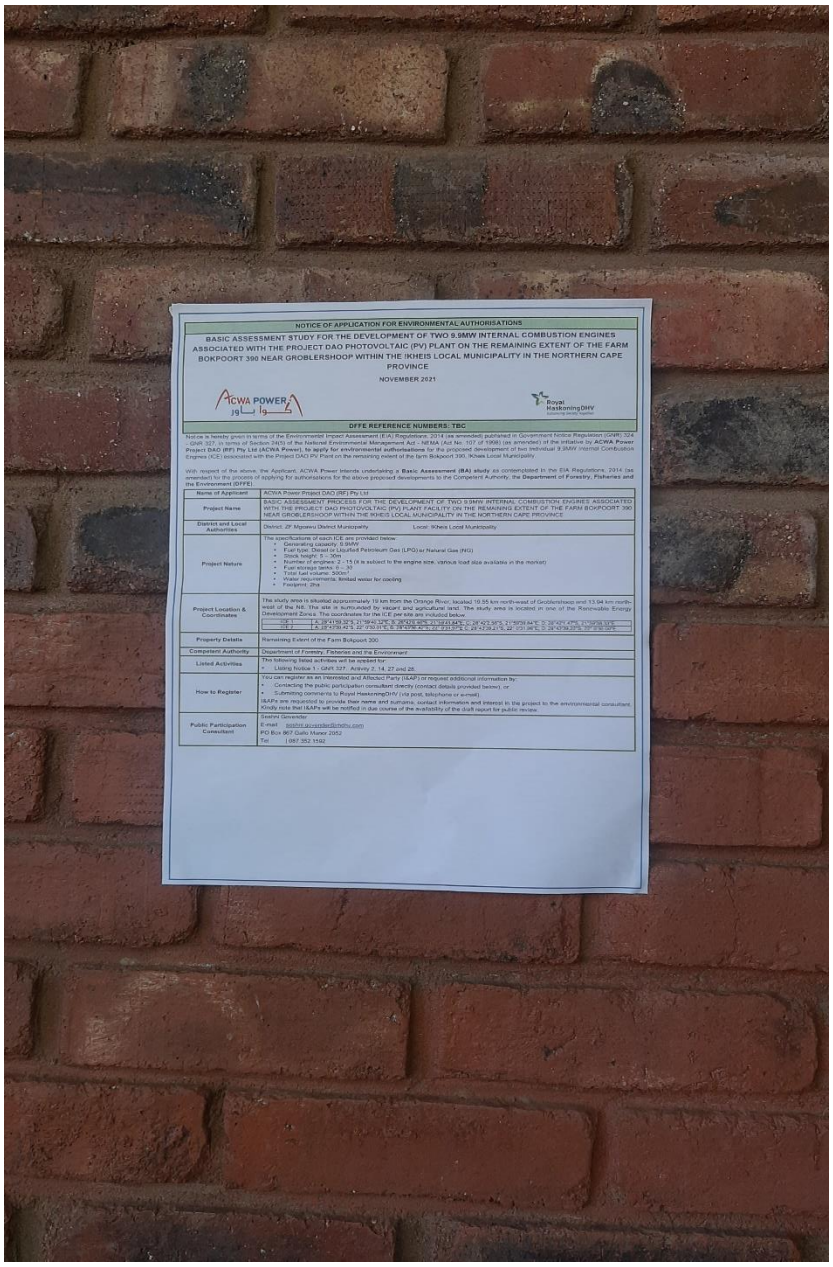


Figure 4-1: Groblershoop Central Business District



NOTICE OF APPLICATION FOR ENVIRONMENTAL AUTHORISATIONS

BASIC ASSESSMENT STUDY FOR THE DEVELOPMENT OF TWO 9.9MW INTERNAL COMBUSTION ENGINES ASSOCIATED WITH THE PROJECT DAO PHOTOVOLTAIC (PV) PLANT ON THE REMAINING EXTENT OF THE FARM BOKPOORT 390 NEAR GROBLERSHOOP WITHIN THE IKHEIS LOCAL MUNICIPALITY IN THE NORTHERN CAPE PROVINCE

NOVEMBER 2021

ACWA POWER

Royal HaskoningDHV

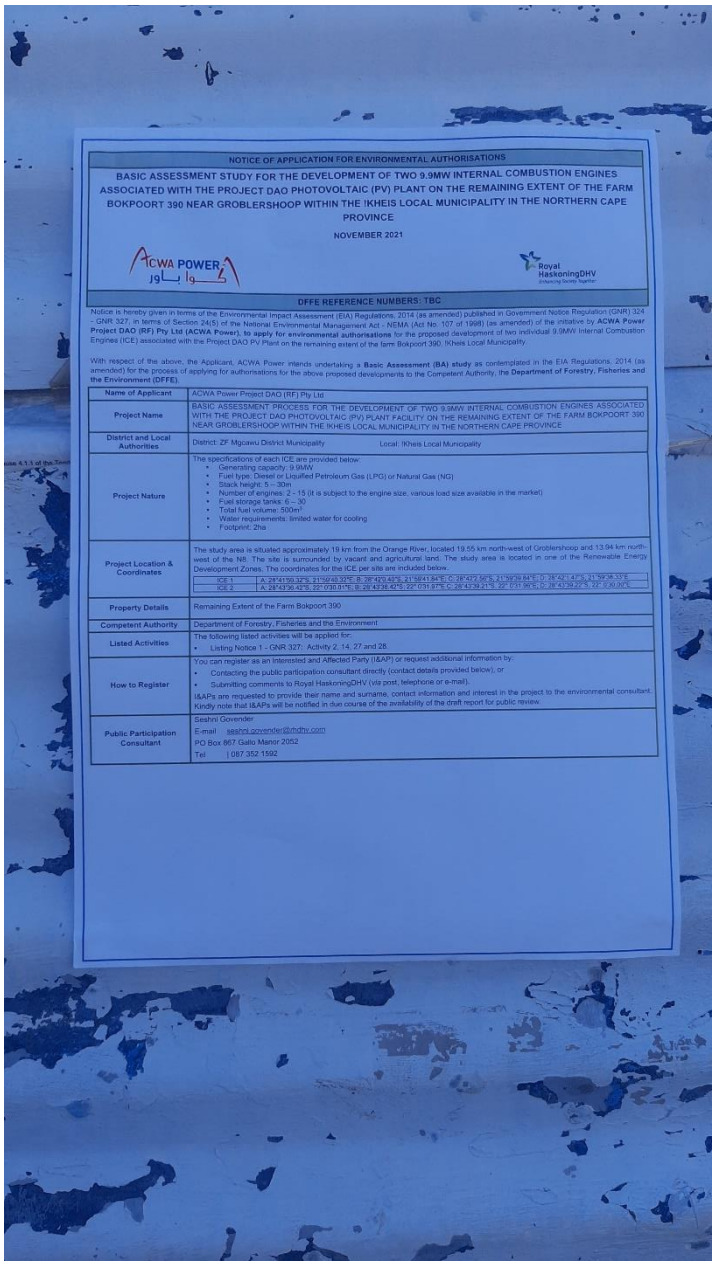
DFFE REFERENCE NUMBERS: TBC

Notice is hereby given in terms of the Environmental Impact Assessment (EIA) Regulations, 2014 (as amended) published in Government Notice Regulation (GNR) 324 GNR 327, in terms of Section 24(5) of the National Environmental Management Act - NEMA (Act No. 107 of 1998) (as amended) of the initiative by **ACWA Power Project DAO (RF) Pty Ltd (ACWA Power), to apply for environmental authorisations** for the proposed development of two individual 9.9MW Internal Combustion Engines (ICE) associated with the Project DAO PV Plant on the remaining extent of the farm Bokpoort 390, Ikheis Local Municipality.

With respect of the above, the Applicant, ACWA Power intends undertaking a **Basic Assessment (BA) study** as contemplated in the EIA Regulations, 2014 (as amended) for the process of applying for authorisations for the above proposed developments to the Competent Authority, the **Department of Forestry, Fisheries and the Environment (DFFE)**.

Name of Applicant	ACWA Power Project DAO (RF) Pty Ltd
Project Name	BASIC ASSESSMENT PROCESS FOR THE DEVELOPMENT OF TWO 9.9MW INTERNAL COMBUSTION ENGINES ASSOCIATED WITH THE PROJECT DAO PHOTOVOLTAIC (PV) PLANT FACILITY ON THE REMAINING EXTENT OF THE FARM BOKPOORT 390 NEAR GROBLERSHOOP WITHIN THE IKHEIS LOCAL MUNICIPALITY IN THE NORTHERN CAPE PROVINCE
District and Local Authorities	District: ZF Mgcawu District Municipality Local: Ikheis Local Municipality
Project Nature	The specifications of each ICE are provided below: • Generating capacity: 9.9MW • Fuel type: Diesel or Liquified Petroleum Gas (LPG) or Natural Gas (NG) • Fuel consumption: • Number of engines: 2 - 15 (it is subject to the engine size, various load size available in the market) • Fuel storage tanks: 6 – 30 • Total fuel volume: 300m³ • Water requirements: limited water for cooling • Footprint: 2ha
Project Location & Coordinates	The study area is situated approximately 10 km from the Orange River, located 19.55 km north-west of Grobleshoop and 13.94 km north-west of the N8. The site is surrounded by vacant and agricultural land. The study area is located in one of the Renewable Energy Development Zones. The coordinates for the ICE per site are included below:
Property Details	Remaining Extent of the Farm Bokpoort 390
Competent Authority	Department of Forestry, Fisheries and the Environment
Listed Activities	The following listed activities will be applied for: • Listing Notice 1 - GNR 327 - Activity 2, 14, 27 and 28.
How to Register	You can register as an Interested and Affected Party (I&AP) or request additional information by: • Contacting the public participation consultant directly (contact details provided below), or • Submitting comments to Royal HaskoningDHV (via post, telephone or e-mail). I&APs are requested to provide their name and surname, contact information and interest in the project to the environmental consultant. Kindly note that I&APs will be notified in due course of the availability of the draft report for public review.
Public Participation Consultant	Beatrid Govender E-mail: [illegible] PO Box 967 Gallo Manor 2052 Tel: (087 352 1502

Figure 4-2: Wegdraai Service Centre



NOTICE OF APPLICATION FOR ENVIRONMENTAL AUTHORISATIONS

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NOVEMBER 2021

ACWA POWER

Royal HaskoningDHV

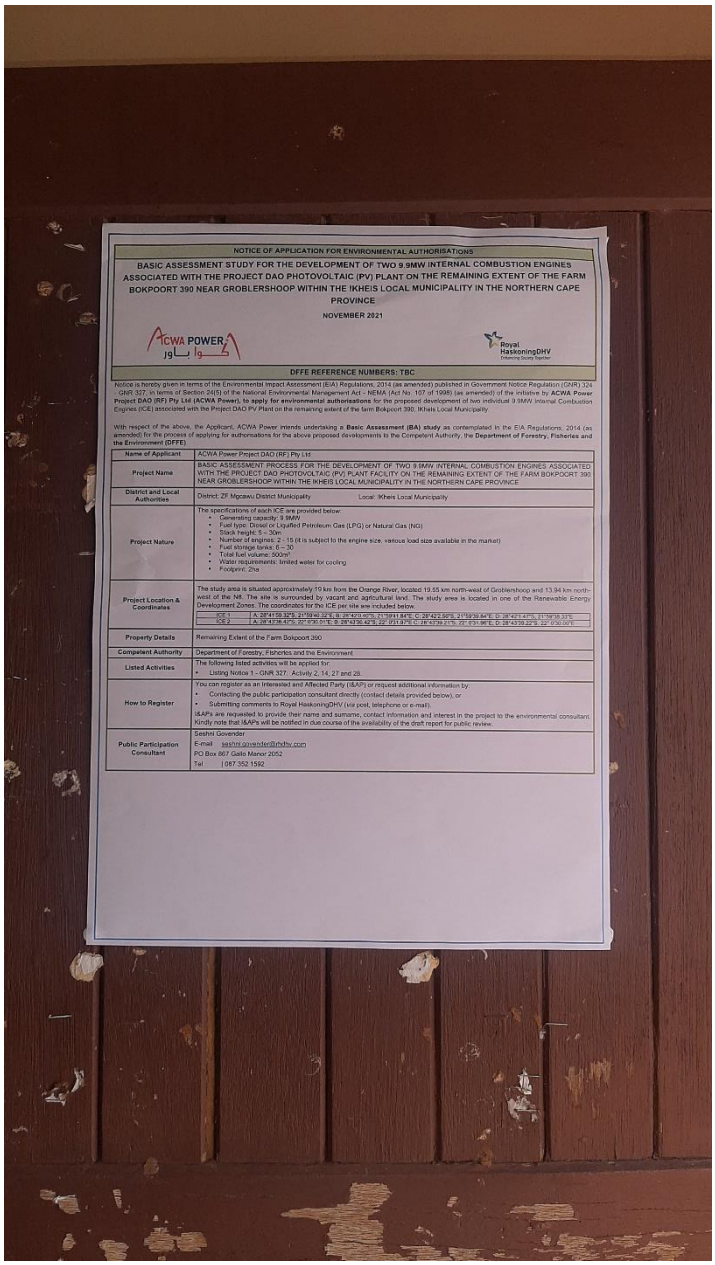
DFFE REFERENCE NUMBERS: TBC

Notice is hereby given in terms of the Environmental Impact Assessment (EIA) Regulations, 2014 (as amended) published in Government Notice Regulation (GNR) 324 – GNR 327, in terms of Section 24(5) of the National Environmental Management Act – NEMA (Act No. 107 of 1998) (as amended) of the initiative by **ACWA Power Project DAO (RF) Pty Ltd (ACWA Power)**, **to apply for environmental authorisations** for the proposed development of two individual 9.9MW Internal Combustion Engines (ICE) associated with the Project DAO PV Plant on the remaining extent of the farm Bokpoort 390, !Kheis Local Municipality.

With respect of the above, the Applicant, ACWA Power intends undertaking a **Basic Assessment (BA) study** as contemplated in the EIA Regulations, 2014 (as amended) for the process of applying for authorisations for the above proposed developments to the Competent Authority, the **Department of Forestry, Fisheries and the Environment (DFFE)**.

Name of Applicant	ACWA Power Project DAO (RF) Pty Ltd
Project Name	BASIC ASSESSMENT PROCESS FOR THE DEVELOPMENT OF TWO 9.9MW INTERNAL COMBUSTION ENGINES ASSOCIATED WITH THE PROJECT DAO PHOTOVOLTAIC (PV) PLANT FACILITY ON THE REMAINING EXTENT OF THE FARM BOKPOORT 390 NEAR GROBLERSHOOP WITHIN THE !KHEIS LOCAL MUNICIPALITY IN THE NORTHERN CAPE PROVINCE
District and Local Authorities	District: ZF Mgcawu District Municipality Local: !Kheis Local Municipality
Project Nature	The specifications of each ICE are provided below: • Generating capacity: 9.9MW • Fuel type: Diesel or Liquified Petroleum Gas (LPG) or Natural Gas (NG) • Stack height: 5 – 30m • Number of engines: 2 – 15 (it is subject to the engine size, various load size available in the market) • Fuel storage tanks: 6 – 30 • Total fuel volume: 500m³ • Water requirements: limited water for cooling • Footprint: 2ha
Project Location & Coordinates	The study area is situated approximately 19 km from the Orange River, located 19.55 km north-west of Groblershoop and 13.94 km north-west of the N8. The site is surrounded by vacant and agricultural land. The study area is located in one of the Renewable Energy Development Zones. The coordinates for the ICE per site are included below. ICE 1: A: 28°41'50.32"S; 21°59'40.32"E; B: 28°42'0.42"S; 21°59'41.84"E; C: 28°42'2.56"S; 21°59'39.84"E; D: 28°42'1.41"S; 21°59'36.33"E ICE 2: A: 28°43'56.42"S; 22°0'30.01"E; B: 28°43'56.42"S; 22°0'31.97"E; C: 28°43'39.21"S; 22°0'31.99"S; D: 28°43'39.22"S; 22°0'30.00"E
Property Details	Remaining Extent of the Farm Bokpoort 390
Competent Authority	Department of Forestry, Fisheries and the Environment
Listed Activities	The following listed activities will be applied for: • Listing Notice 1 - GNR 327: Activity 2, 14, 27 and 28.
How to Register	You can register as an Interested and Affected Party (I&AP) or request additional information by: • Contacting the public participation consultant directly (contact details provided below); or • Submitting comments to Royal HaskoningDHV (via post, telephone or e-mail). I&APs are requested to provide their name and surname, contact information and interest in the project to the environmental consultant. Kindly note that I&APs will be notified in due course of the availability of the draft report for public review.
Public Participation Consultant	Seshni Govender E-mail: seshni.govender@rhdhv.com PO Box 867 Gallo Manor 2052 Tel: | 087 352 1592

Figure 4-3: Sterhnam Service Centre



NOTICE OF APPLICATION FOR ENVIRONMENTAL AUTHORISATIONS

BASIC ASSESSMENT STUDY FOR THE DEVELOPMENT OF TWO 9.9MW INTERNAL COMBUSTION ENGINES ASSOCIATED WITH THE PROJECT DAO PHOTOVOLTAIC (PV) PLANT ON THE REMAINING EXTENT OF THE FARM BOKPOORT 390 NEAR GROBLERSHOOP WITHIN THE !KHEIS LOCAL MUNICIPALITY IN THE NORTHERN CAPE PROVINCE

NOVEMBER 2021

DFFE REFERENCE NUMBERS: TBC

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With respect of the above, the Applicant, ACWA Power intends undertaking a **Basic Assessment (BA) study** as contemplated in the EIA Regulations, 2014 (as amended) for the process of applying for authorisations for the above proposed developments to the Competent Authority, the **Department of Forestry, Fisheries and the Environment (DFFE)**.

Name of Applicant	ACWA Power Project DAO (RF) Pty Ltd
Project Name	BASIC ASSESSMENT PROCESS FOR THE DEVELOPMENT OF TWO 9.9MW INTERNAL COMBUSTION ENGINES ASSOCIATED WITH THE PROJECT DAO PHOTOVOLTAIC (PV) PLANT FACILITY ON THE REMAINING EXTENT OF THE FARM BOKPOORT 390 NEAR GROBLERSHOOP WITHIN THE !KHEIS LOCAL MUNICIPALITY IN THE NORTHERN CAPE PROVINCE
District and Local Authorities	District: ZF Mgcawu District Municipality Local: !Kheis Local Municipality
Project Nature	The specifications of each ICE are provided below: • Generating capacity: 9.9MW • Fuel type: Diesel or Liquified Petroleum Gas (LPG) or Natural Gas (NG) • Stack height: 5 – 30m • Number of engines: 2 – 10 (it is subject to the engine size, various load size available in the market) • Fuel storage tanks: 5 – 30 • Total fuel volume: 500m³ • Water requirements: limited water for cooling • Footprint: 2ha
Project Location & Coordinates	The study area is situated approximately 19 km from the Orange River, located 19.55 km north-west of Groblershoop and 13.94 km north-west of the N8. The site is surrounded by vacant and agricultural land. The study area is located in one of the Renewable Energy Development Zones. The coordinates for the ICE per site are included below. ICE 1 | A: 28°41'58.39"S, 21°59'40.12"E | B: 28°42'0.40"S, 21°59'41.84"E | C: 28°42'2.56"S, 21°59'39.84"E | D: 28°42'1.47"S, 21°59'39.33"E ICE 2 | A: 28°43'36.43"S, 22°3'30.01"E | B: 28°43'36.42"S, 22° 3'31.97"E | C: 28°43'39.31"S, 22° 3'31.96"E | D: 28°43'39.22"S, 22° 3'30.00"E
Property Details	Remaining Extent of the Farm Bokpoort 390
Competent Authority	Department of Forestry, Fisheries and the Environment
Listed Activities	The following listed activities will be applied for: • Listing Notice 1 - GNR 327: Activity 2, 14, 27 and 28.
How to Register	You can register as an Interested and Affected Party (I&AP) or request additional information by: • Contacting the public participation consultant directly (contact details provided below), or • Submitting comments to Royal HaskoningDHV (via post, telephone or e-mail). I&APs are requested to provide their name and surname, contact information and interest in the project to the environmental consultant. Kindly note that I&APs will be notified in due course of the availability of the draft report for public review.
Public Participation Consultant	Sashni Govender E-mail: sashni.govender@rhdhv.com PO Box 867 Gallo Manor 2052 Tel: 087 352 1592

Figure 4-4: Boegoeberg Service Centre

5 Advertisement

In compliance with the EIA Regulations 2014 (as amended), notification of the commencement of the BA study for the project was advertised in a one local newspaper, the Gemsbok Newspaper on 8 December 2021 in English (**AppendixB**). An additional Advert will be placed in one local newspaper, the Gemsbok Newspaper on the 27th April 2022 indicating the commencement of the second 30 day public review period.

I&APs were requested to register their interest in the project and become involved in the BA study. The primary aim of this advertisement was to ensure that the widest group of I&APs possible was informed and invited to provide input and questions and comments on the project. I&APs were also notified of the availability of the draft revised cBAR for public review. (**Appendix B**).

6 Public Review of the Draft Consultation BAR

The draft cBAR was made available for authority and public review for an initial of 30 days from 14 December 2021 – 04 February 2022 (15 December – 05 January were excluded). The draft revised cBAR will be made available for a further 30 days from 03 May 2022 – 01 June 2022.

The report was made available at the following public locations within the study area, which are all readily accessible to I&APs:

- !Kheis Local Municipality Municipal Office;
- !Kheis Municipal Public Library - Groblershoop;
- Electronically on the Royal HaskoningDHV Website: https://global.royalhaskoningdhv.com/countries/southern-africa/environmental-reports

7 Meetings

No meetings were conducted for the project.

8 Comments and Responses Record

A Comments and Response Record has been compiled reflecting all comments and issues received and responded to (Table 8-1) as well as the proof of comments received (**Appendix D**).

Table 8-1: Comments and Response Table

Date of Comment, Format of Comment, Name of Organisation/I&AP	Comment	Response from EAP/Applicant/Specialist
08/11/2021 Email Eskom Holdings SOC Ltd	Please find attached Eskom general requirements for works at or near Eskom infrastructure and servitudes. Please send me a KMZ file of the proposed development footprints of the ICE's.	EAP Response: I will forward the requirements to the applicant, please find attached the KMZ for the additional ICE's as requested. Email sent on 08/11/2021
24/01/2022 Written submission via Email Department of Forestry, Fisheries and the Environment	Project Title: ▪ It is noted that the cover page of the draft BAR mentions that the proposed development (ICE) will be associated with both Afrikaans and Sotho PV plants, whereas the proposed project is specifically associated with Afrikaans PV plant only. Please ensure that the final BAR only refer to Afrikaans PV only.	EAP Response: A combined BAR has been compiled for both applications (Afrikaans and Sotho) due to similar findings and impacts. The reports will be amended accordingly to reflect each individual plant.
	Listed Activities: ▪ On page 6 of 30 of the application form, it is indicated that the fuel type considered for this development is Diesel or Liquified Petroleum Gas (LPG) or Liquified Natural Gas (LNG) whereas on page 31, 138 and 144 of the draft BAR, LPG/LNG is mentioned as the preferred fuel alternative. Please confirm the preferred alternative, ensure that the preferred alternative is indicated in both the application form and the final BAR and the impacts related to such are also assessed in the final BAR. ▪ Please ensure that all relevant listed activities are applied for, are specific and can be linked to the development activity or infrastructure as described in the project description. Only activities applicable to the development must be applied for and assessed. In addition, the onus is on the applicant and the environmental assessment practitioner (EAP) to ensure that all the applicable listed activities are included in the application form. Failure to do so may result in unnecessary delays in the processing of the application. ▪ If the activities applied for in the application form differ from those mentioned in the final BAR, an amended application form must be submitted. Please note that the Department's application form template has been amended and can be downloaded from the following link: https://www.environment.gov.za/documents/forms.	EAP Response: ▪ Refer to section 4.3 of the BAR. ▪ Noted, all applicable activities have been applied for, Refer to section 3, Table 10 of the BAR. ▪ Activities have been updated.

Date of Comment, Format of Comment, Name of Organisation/I&AP	Comment	Response from EAP/Applicant/Specialist
	Specialist Assessment: Ensure that specialist studies, where applicable comply with the requirements of GN 320 of 20 March 2020 and GN 1150 of 30 October 2020 unless proof is provided that indicates that the specialist study was commissioned within 50 days after the date of gazetting of the notice i.e. 20 Mach 2020 and was commissioned prior to 30 October 2020 respectively. Failure to comply with the abovementioned notices presents a risk to this application.	EAP Response: Refer to Appendix C of the BAR for compliance statements (where applicable) with regards to GN 320 and GN 1150.
	Cumulative Assessment: It is noted that there are authorised renewable projects, which are located within a 30km radius of the project site, the cumulative impact assessment for all identified and assessed impacts must be refined to indicate the following: ▪ Identified cumulative impacts must be clearly defined, and where possible the size of the identified impact must be quantified and indicated, i.e. hectares of cumulatively transformed land. ▪ Detailed process flow and proof must be provided, to indicate how the specialist's recommendations, mitigation measures and conclusions from the various similar developments in the area were taken into consideration in the assessment of cumulative impacts and when the conclusion and mitigation measures were drafted for this project. ▪ The cumulative impacts significance rating must also inform the need and desirability of the proposed development. ▪ A cumulative impact environmental statement on whether the proposed development must proceed.	EAP Response: Refer to section 8.3 of the BAR and section 2.4 of the BAR.

Date of Comment, Format of Comment, Name of Organisation/I&AP	Comment	Response from EAP/Applicant/Specialist
	Layout and Sensitivity Map: The Department has noted that in Appendix A, a locality map and a sensitivity map for the proposed development have been provided however the layout is not provided, ensure that the layout plan is provided as required in terms of Appendix 1 (3)(1) (c) and must indicate the following: ▪ All onsite infrastructure (existing and proposed) ▪ The location of sensitive environmental features on site, e.g., wetlands, drainage lines etc. that will be affected; ▪ Buffer areas; and ▪ All “no-go” areas.	EAP Response: Refer to Appendix A of the BAR.
	Undertaking of an Oath: ▪ The Department has noted that the submitted application form has an undertaking under oath or affirmation by the EAP. However, the aforementioned oath was not included in the draft BAR, but rather an appendix of the application form attached to the BAR. Please note that the final BAR must also have an undertaking under oath/ affirmation by the EAP. ▪ Based on the above, you are therefore required to include an undertaking under oath or affirmation by the EAP (administered by a Commissioner of Oaths) as per Appendix 1(3)(r) of the NEMA EIA Regulations, 2014, as amended, which states that the BAR must include: “an undertaking under oath or affirmation by the EAP in relation to: a) the correctness of the information provided in the reports; b) the inclusion of comments and inputs from stakeholders and I&APs; c) the inclusion of inputs and recommendations from the specialist reports where relevant; and d) any information provided by the EAP to interested and affected parties and any responses by the EAP to comments or inputs made by interested and affected parties”.	EAP Response: An oath has been provided in section 8.7 of the BAR.

Date of Comment, Format of Comment, Name of Organisation/I&AP	Comment	Response from EAP/Applicant/Specialist
	Public Participation Process: ▪ Please ensure that comments from all relevant stakeholders are submitted to the Department with the final BAR. This includes but not limited to the Department of Forestry, Fisheries and the Environment (DFFE): Air Quality Authorisations; Northern Cape Department of Agriculture, Environmental Affairs, Rural Development and Land Reform; Department of Agriculture, Land Reform & Rural Development, Department of Human Settlement, Water and Sanitation; !Kheis Local Municipality; ZF Mgcawu District Municipality; Department Roads and Public Works; Eskom Holdings SOC Ltd; Department of Mineral Resources and Energy; South African Heritage Resources Agency (SAHRA); Endangered Wildlife Trust; Birdlife South Africa; Airports Company of South Africa; Department of Mineral Resources and Energy; Square Kilometre Array (SKA); South African Heritage Resource Agency (SAHRA); South African Civil Aviation Authority (SACAA); Square Kilometre Array (SKA) and Oranje Vaal Water Use Association. ▪ Furthermore, ensure that all issues raised and comments received during the circulation of the draft BAR from registered I&APs and organs of state which have jurisdiction in respect of the proposed activity are adequately addressed in the final BAR. ▪ Proof of correspondence with the various stakeholders must be included in the final BAR. This must indicate that this draft BAR has been subjected to 30 days' public participation process, stating the start and end date of the public participation process (PPP). Should you be unable to obtain comments, proof must be submitted to the Department of the attempts that were made to obtain comments. ▪ The Public Participation Process must be conducted in terms of Regulations 39, 40, 41, 42, 43 & 44 of the EIA Regulations, 2014.	EAP Response: Refer to PP report (Appendix F). Refer to section 6 of the BAR and PP Report (Appendix F), furthermore PP has been conducted as per the PP plan approved by the DFFE.

Date of Comment, Format of Comment, Name of Organisation/I&AP	Comment	Response from EAP/Applicant/Specialist
	You are further reminded to comply with Regulation 19(1)(a) of the NEMA EIA Regulations, 2014, as amended, which states that: “Where basic assessment must be applied to an application, the applicant must, within 90 days of receipt of the application by the competent authority, submit to the competent authority – (a) a basic assessment report, inclusive of any specialist reports, an EMPr, a closure plan in the case of a closure activity and where the application is a mining application, the plans, report and calculations contemplated in the Financial Provisioning Regulations, which have been subjected to a public participation process of at least 30 days and which reflects the incorporation of comments received, including any comments of the competent authority”. Should there be significant changes or new information that has been added to the BAR or EMPr which changes or information was not contained in the reports or plans consulted on during the initial public participation process, you are required to comply with Regulation 19(1)(b) of the NEMA EIA Regulations, 2014, as amended, which states: “the applicant must, within 90 days of receipt of the application by the competent authority, submit to the competent authority – (b) a notification in writing that the documents contemplated in subregulation 1(a) will be submitted within 140 days of receipt of the application by the competent authority, as significant changes have been made or significant new information has been added to the documents which changes or information was not contained in the original documents consulted on during the initial public participation process contemplated in subregulation (1)(a) and that the revised documents will be subjected to another public participation process of at least 30 days.” Should you fail to meet any of the timeframes stipulated in Regulation 19 of the NEMA EIA Regulations, 2014, as amended, your application will lapse.	EAP Response: Noted.

Date of Comment, Format of Comment, Name of Organisation/I&AP	Comment	Response from EAP/Applicant/Specialist
11/02/2022 Written Submission via SAHRIS South African Heritage Resource Agency	The following comments are made as a requirement in terms of section 3(4) of the NEMA Regulations and section 38(8) of the NHRA in the format provided in section 38(4) of the NHRA and must be included in the Final BAR and EMPr: ▪ 38(4)a – The SAHRA Archaeology, Palaeontology and Meteorites (APM) Unit has no objections to the proposed development; ▪ 38(4)b – The recommendations of the specialists are supported and must be adhered to. No further additional specific conditions are provided for the development; ▪ 38(4)c(i) – If any evidence of archaeological sites or remains (e.g. remnants of stone-made structures, indigenous ceramics, bones, stone artefacts, ostrich eggshell fragments, charcoal and ash concentrations), fossils or other categories of heritage resources are found during the proposed development, SAHRA APM Unit (Natasha Higgitt/Phillip Hine 021 462 5402) must be alerted as per section 35(3) of the NHRA. Non-compliance with section of the NHRA is an offense in terms of section 51(1)e of the NHRA and item 5 of the Schedule; ▪ 38(4)c(ii) – If unmarked human burials are uncovered, the SAHRA Burial Grounds and Graves (BGG) Unit (Thingahangwi Tshivhase/ Ngqalabutho Madida 012 320 8490), must be alerted immediately as per section 36(6) of the NHRA. Non-compliance with section of the NHRA is an offense in terms of section 51(1)e of the NHRA and item 5 of the Schedule; ▪ 38(4)d – See section 51 of the NHRA regarding offences; ▪ 38(4)e – The following conditions apply with regards to the appointment of specialists: ▪ With reference to the mitigation work noted above, a qualified archaeologist must be appointed to undertake the work in terms of the permit applied for as noted above; ▪ If heritage resources are uncovered during the course of the development, a professional archaeologist or palaeontologist, depending on the nature of the finds, must be contracted as soon as possible to inspect the heritage resource. If the newly discovered heritage resources prove to be of archaeological or palaeontological significance, a Phase 2 rescue operation may be required subject to permits issued by SAHRA; ▪ The Final BAR and EMPr must be submitted to SAHRA for record purposes; ▪ The decision regarding the EA Application must be communicated to SAHRA and uploaded to the SAHRIS Case application.	EAP Response: The recommendations provided by SAHRA are included in the BAR and EMPr (Appendix E). The final BAR and EMPr will be uploaded to the SAHRIS Case application for record purposes as well as the decision regarding the EA application when issued.

9 Environmental Authorisation

On receipt of environmental authorisations (positive or negative) for the project, I&APs registered on the project database will be informed of this authorisation and its associated terms and conditions by correspondence and advertisement.

Appendix A: Approved Public Participation Plan

From: [redacted]
To:
Cc:

Subject: Approval of PP plan
Date: 04 November 2021 11:13:24
Attachments: MD4195-RHD-ZZ-XX-CO-Z-0001-PP Plan_Two 9.9MW ICE BA_f01.docx

Dear Mr Roods

Public Participation Plan for Project DAO – Two (2) 9.9MW Internal Combustion Engine (ICE) Basic Assessment received by this Department on 22 October 2021, refers.

Based on the information provided this Department decided to approve the PP Plan for the proposed project. You may proceed with the PP process in accordance with tasks contemplated in the PP plan. Should you wish to deviate from the submitted PP Plan, an amended PP Plan must be submitted to the Department for approval prior commencement.

A copy of the PP Plan and this approval must be submitted as part of the application form when the application is lodged.

Also note that submission of a PP Plan and approval thereof do not negate your responsibility to comply with the requirements for public participation in terms of Regulations 39, 40, 41, 42, 43 & 44 of the EIA Regulations 2014, as amended.

[redacted]

Royal HaskoningDHV
Enhancing Society Together

ROYAL HASKONINGDHV (PTY) LTD
21 Woodlands Drive
Building 5
Country Club Estate
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Department of Forestry, Fisheries and the Environment
Integrated Environmental Authorisations
Attn: Thando Booi, Olivia Letlalo, Mahlatse Shubane
Ref 2021-10-0023

Date:	22 October 2021	Contact name:	[redacted]
Your reference:	2021-07-0008	Telephone:	
Our reference:	MD4195-RHD-ZZ-XX-CO-Z-0001	Email:	
Classification:	Project related		

Public Participation Plan: Project DAO – Two (2) 9.9MW Internal Combustion Engine (ICE) Basic Assessment

Dear Sirs/Mams

Like any other solar technology, photovoltaic power plants can only generate electricity when the weather is favourable. The country is in dire need of electricity and especially during peak hours. In order to address this need, ACWA Power has proposed additional infrastructure within their plants to create the flexibility and efficiency of the plants to allow for electricity generation during unfavourable weather conditions. This can be achieved by including an Internal Combustion Engine (ICE).

In May 2021, seven (7) 9.9MW ICE were approved:

- Ndebele (14/12/16/3/3/1/2300);
- Venda (14/12/16/3/3/1/2296);
- Zulu (14/12/16/3/3/1/2295);
- Afrikaans (14/12/16/3/3/1/2301);
- Sotho (14/12/16/3/3/1/2298);
- Swati (14/12/16/3/3/1/2297); and
- Pedi (14/12/16/3/3/1/2299).

In August 2021, ACWA Power, in meeting the conditions of the Environmental Authorisation (EA), submitted an amended EMPr and ICE layout. Based on the reduced layout, ACWA Power decided to lapse four (4) of the seven (7) ICE EAs on the basis that the Department of Mineral Resources and Energy (DMRE) would offer them relaxation of the reliability run. However, DMRE snow confirmed that they will not be relaxing the reliability run requirements and as such, ACWA Power needs to add (two) 2 ICE in addition to the following plants that have ICE approved:

- Venda PV Plant (Ref 14/12/16/3/3/1/2196);
- Pedi PV Plant (Ref 14/12/16/3/3/1/2299); and

- Ndebele PV Plant (Ref 14/12/16/3/3/1/2300).

The four EAs that have been lapsed are: Zulu, Afrikaans, Sotho, and Swati PV Plant ICE.

As per Government Gazette 43412 GN R. 650 Disaster Management Act (57/2002): Directions Regarding Measures to Address, Prevent and Combat the Spread of COVID-19 Relating to National Environmental Management Permits and Licences: Annexure 2 and 3 published on 5 June 2020, the Department of Forestry, Fisheries and the Environment (DFFE) requires a Public Participation (PP) Plan to be approved for an application for EA that requires public participation.

PP is a process designed to enable all Interested and Affected parties (I&APs) to voice their opinion and/or concerns, which enables the practitioner to evaluate all aspects of the proposed development to improve the project by maximising its benefits while minimising its adverse effects.

I&APs include all interested stakeholders, technical specialists, and the various relevant organs of state who work together to produce better decisions.

The primary aims of the PP process are:

- to inform I&APs and key stakeholders of the proposed application and environmental studies;
- to initiate meaningful and timeous participation of I&APs;
- to identify issues and concerns of key stakeholders and I&APs with regards to the development;
- to promote transparency and an understanding of the project and its potential environmental (social and biophysical) impacts (both positive and negative);
- to provide information used for decision-making;
- to provide a structure for liaison and communication with I&APs and key stakeholders;
- to ensure inclusivity (the needs, interests, and values of I&APs must be considered in the decision-making process);
- to focus on issues relevant to the project and issues considered important by I&APs and key stakeholders; and
- to provide responses to I&AP queries.

The public participation process must adhere to the requirements of Regulations 39 - 44 (GN R.326). Further, a Public Participation guideline in terms of NEMA was issued by the DFFE in 2017, of which provisions will also be implemented.

PUBLIC PARTICIPATION PLAN

1. Identification of I&APs

An I&AP database is already available due to previous projects undertaken on the same property. The I&AP database will be updated with new I&APs requesting to be registered and will be maintained throughout the duration of the project. All registered I&APs on the database will be informed of the project, review period, and outcome of the decision issued by DFFE to approve the application for EA and the Basic Assessment Report (BAR).

2. Advertisement

In compliance with the EIA Regulations 2014 (as amended), notification of the Basic Assessment study and period for review will be advertised in the Gemsbok Newspaper. In addition, a hard copy of the BAR will be made available at the !Kheis Municipal Library and the !Kheis Local Municipality Municipal Office for review and comment.

3. Review of the BAR

The BAR will be made available electronically for review for 30 days, via the Royal HaskoningDHV Website as well as via email:
https://www.royalhaskoningdhv.com/en/south-africa/projects/environmental-reports.

A hard copy of the BAR will be made available at the !Kheis Municipal Library and the !Kheis Local Municipality Municipal Office for review and comment.

At the time of compilation of this document, adjusted Level 1 COVID-19 restrictions are in place; therefore it is proposed that hard copies of the BAR will be made available at the !Kheis Municipal Library and !Kheis Local Municipality for review and comment. These locations have been chosen as they are required to ensure that COVID-19 regulations and protocols (no mask, no entry, provision of sanitiser and sanitising hands upon entry and exit, social distancing of 1.5m) are in place according to the Disaster Management Act, 2002. However, should I&APs be unable to access these documents, they are welcome to request a copy directly from the EAP.

4. Meetings

No meetings are proposed for the project, however, should any I&AP specifically request a meeting, this will be held virtually. In the event that, meetings cannot be held virtually, telephonic consultation will take place, whereafter, minutes of the discussion will be sent via email to the I&AP.

5. Comments and Responses Report (CRR)

A CRR will be compiled with any comments and issues received and responded to which will form part of the submission of the final BAR to the Department.

Comments must be forwarded either via email, letter, by hand (if delivered via hand, masks will be utilised as well as sanitising of hands prior to and after handing the letter to the I&AP) or via phone calls (documented in a letter or email thereafter) to:
Seshni Govender
PO Box, 867, Gallo Manor, 2052
Tel: 087 352 1592, Email: Seshni.govender@rhdhv.com

6. Environmental Authorisation

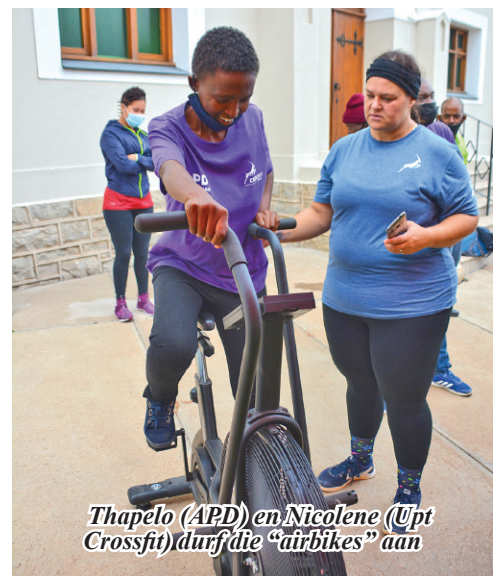
On receipt of the EA (positive or negative) for the proposed project, I&APs registered on the project database will be informed of this decision and its associated terms and conditions, as well as the appeal process by email correspondence.

Kind Regards

Prashika
EAP

Appendix B: Advert

Burpees en Box-Jumps is hierdie Upignton Crossfitter se kos



Thapelo (APD) en Nicolene (Upt Crossfit) durf die "airbikes" aan

Crossfitters ondersteun APD se Durf en Deernis Pretdag

Dawid (Upt Crossfit) en Cornè (APD) skrik nie vir 'n 'snatch nie'

Stefanus van Upington Crossfit wys sy straal

Die Durf en Deernis Pretloop is ook deur die Crossfitters en lede van die Upington Crusaders ondersteun

Uppies vereer sportsterre

GEMSBOK-UPINGTON: Hoërskool Upington het onlangs weer die voorreg gehad om 'n volwaardige prysuitdeling te hou.

Die juniors het nou wel nie 100% deel gehad nie, maar sover Covid ons toegelaat het, kon hulle die seniors vereer vir hul harde werk ten spyte van die ongewone omstandighede. Wat nog beter was, is die feit dat hul ouers saam met hul in die spoggeleentheid kon deel.

Pragtige prestasies is vereer en ouers kon met trots toekyk hoe hul kinders op die verhoog stap.

Hier volg die sport hoogtepunte:

Red en Judy Redelinghuysbeker vir beste dogter swemmer – Cameron Gilbert

Red en Judy Redelinghuysbeker vir beste seun swemmer - Murray Louw

Beste Veergeweerskut Trofee: Skiet – Wian van As

Beste Sportergeweerskut Trofee: Skiet – Janko Botma

Uitsonderlike Sportprestasie: Groen kleure by die SAEF Western Mounted Games Juniorspan O/18 – Vrele du Toit

Beste dogter swemmer – Cameron Gilbert

Beste seun swemmer - Murray Louw

Beste Sportergeweerskut - Janko Botma

Beste Veergeweerskut - – Wian van As

Western Mounted Games Juniorspan O/18 – Vrele du Toit

NOTICE OF APPLICATIONS FOR ENVIRONMENTAL AUTHORISATION

BASIC ASSESSMENT FOR THE DEVELOPMENT OF TWO 9.9MW INTERNAL COMBUSTION ENGINES ASSOCIATED WITH THE PREVIOUSLY AUTHORISED AFRIKAANS AND SOTHO PHOTOVOLTAIC (PV) PLANTS ON THE REMAINING EXTENT OF THE FARM BOKPOORT 390 NEAR GROBLERSHOOP WITHIN THE !KHEIS LOCAL MUNICIPALITY IN THE NORTHERN CAPE PROVINCE.

DFFE REF NUMBER: 14/12/16/3/3/1/2469 (AFRIKAANS)
14/12/16/3/3/1/2470 (SOTHO)

In May 2021, ACWA Power Project DAO (RF) Pty Ltd (hereafter ACWA Power) was issued with seven Environmental Authorisations (EAs) for the development of seven individual 9.9MW Internal Combustion Engines (ICE) on the authorised Pedi, Venda, Zulu, Afrikaans, Ndebele, Swati and Sotho Photovoltaic (PV) Plants on the Remaining Extent (RE) of the Farm Bokpoort 390, located 20km north west of the town of Groblershoop within the !Kheis Local Municipality in the ZF Mgcawu District Municipality, Northern Cape Province.

In September 2020, the Department of Mineral Resources and Energy (DMRE) released a request for proposal as part of the Risk Mitigation Independent Power Producer Procurement Programme to reduce the current load shedding periods being experienced by the country. In responding to the request, ACWA Power submitted a bid for a 150MW (export capacity) PV plant that was bid as "Project DAO" and were successful. A condition in the Request for Proposal required Bidders to not tap into the national grid for power and requires that a reliability test for only 15 days be undertaken at a specified generation rate and time, once the Power Purchase Agreement has been finalised. PV can only generate electricity when the weather is favourable. In order to address this need, ACWA Power proposed additional infrastructure ICE within their authorised plants to create flexibility and efficiency within the plants for the reliability test period.

However, the DMRE informed bidders that these requirements would be amended, and ACWA Power decided to lapse four of the seven ICE EAs, the four EAs that have been lapsed are Zulu, Afrikaans, Sotho, and Swati PV Plant ICE. The DMRE has now confirmed that they are not amending the reliability run requirements, and as such, ACWA Power now needs two additional ICE infrastructure to meet these requirements. Each of the ICEs will be subject to its own application for Environmental Authorisation. The Applicant, intends undertaking a Basic Assessment (BA) process as contemplated in the EIA Regulations, 2014 (as amended) for the purposes of applying for an authorisation for the above proposed development to the Competent Authority, the Department of Forestry, Fisheries and the Environment (DFFE). An initial Public Participation period was held from the 14 December 2021 – 04 February 2022, and due to changes in the optimisation of the plant and changes in the preferred fuel source i.e diesel, all Interested and Affected Parties (I&APs) are requested to review and comment on the revised consultation BA Report.

The updated specifications for each of the ICE associated with the Afrikaans and Sotho PV Plants are provided below:

- Generating capacity: 9.9MW
- Fuel Type: Diesel
- Stack height: 5.8m
- Number of engines for the ICE: Afrikaans: 11 Engines (generating capacity per engine ~1MW)
  Sotho: 12 Engines (generating capacity per engine ~1MW)
- Fuel storage tanks: Afrikaans: 2 x 71.6 m^3 fuel tanks and 1 x 35.3 m^3 fuel tank
  Sotho: 2 x 71.6 m^3 fuel tanks and 1 x 35.3 m^3 fuel tank
- Fuel volume: Combined capacity of less than 500m^3 per ICE plant
- Water requirements: Water for cooling which falls within the already assessed threshold i.e. 22 000m^3
- Area size: 0.5 ha per ICE

PUBLIC PARTICIPATION PROCESS

The public participation process for the revised consultation BA Report aims to provide I&APs with updated information regarding the proposed project and will provide an opportunity to raise any issues or concerns.

As part of the public participation process, you are invited to review the revised consultation BA Report and make comment on the document. The report will be available for review at the following public places:

- !Kheis Local Municipal Offices - 97 Oranje Street, Groblershoop; and
- !Kheis Municipality Public Library - 97 Oranje Street, Groblershoop

A copy will also be available for download from the Royal HaskoningDHV website: **https://global.royalhaskoningdhv.com/countries/southern-africa/environmental-reports**

The revised consultation BA Report is now available for review and comment for 30 days from **03 May – 01 June 2022.**

WHO SHOULD YOU CONTACT?

The Environmental Team from Royal HaskoningDHV, as independent environmental assessment practitioners, have been appointed to conduct the environmental studies.

I&APs are invited to register by submitting their name, contact information and interest in the project to the environmental consultants. Comments on the revised consultation BA Report can also be sent to the environmental consultants. Contact details are provided below.

Seshni Govender
Royal HaskoningDHV
PO Box 867, Gallo Manor, 2052, Gauteng
Tel | 087 352 1592
E-mail | **seshni.govender@rhdhv.com**

Royal HaskoningDHV
Enhancing Society Together

Appendix C: Proof of Notifications

Seshni Govender

From: Seshni Govender
Sent: Friday, 05 November 2021 15:54
To: [redacted]
Cc:
Subject: The Development of two 9.9MW ICEs associated with the Project DAO PV Facility on the Remaining Extent of the Farm Bokpoort 390, !Kheis Local Municipality
Attachments: MD4195-RHD-ZZ-XX-CO-Z-0001-Additional ICE Initial Notification_F01.pdf

Importance: High

Dear Stakeholder

Notice is hereby given in terms of the Environmental Impact Assessment (EIA) Regulations, 2014 (as amended in 2021) published in Government Notice Regulation (GNR) 324 - GNR 327, in terms of Section 24(5) of the National Environmental Management Act - NEMA (Act No. 107 of 1998) (as amended) of the initiative by being undertaken by ACWA Power Project DAO (RF) Pty Ltd to develop two individual 9.9MW Internal Combustion Engines (ICE) associated with the Project DAO PV Plant on the Remaining Extent of the Farm Bokpoort 390 near Groblershoop.

Please find attached initial notification regarding the project.

In accordance with the Protection of Personal Information (POPI) Act, your details will be securely stored and will not be shared with any third parties. If you wish to be removed from this database, please send an email to: seshni.govender@rhdhv.com.

Regards
Seshni Govender (*Pr. Sci. Nat.*)
Environmental Consultant

D 087 352 1592 | **E** seshni.govender@rhdhv.com | **W** www.rhdhv.co.za
Royal HaskoningDHV (Pty) Ltd trading as Royal HaskoningDHV | Reg No. 1966/001916/07
Building No. 5 Country Club Estate, 21 Woodlands Drive, Woodmead, 2191
PO Box 867, Gallo Manor, 2052, Gauteng, South Africa

Please, consider your environment.
Before printing this e-mail ask yourself: "Do I need a hard copy?"

Seshni Govender

From: Seshni Govender
Sent: Friday, 05 November 2021 15:50
To: [redacted]
Cc:
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Building No. 5 Country Club Estate, 21 Woodlands Drive, Woodmead, 2191
PO Box 867, Gallo Manor, 2052, Gauteng, South Africa

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From:	Seshni Govender
To:	[redacted]
Cc:	
Subject:	The Development of two 9.9MW ICEs associated with the Project DAO PV Facility on the Remaining Extent of the Farm Bokpoort 390, !Kheis Local Municipality
Date:	Friday, 05 November 2021 15:55:00
Attachments:	MD4195-RHD-ZZ-XX-CO-Z-0001-Additional ICE Initial Notification_F01.pdf
Importance:	High

Dear Stakeholder

Notice is hereby given in terms of the Environmental Impact Assessment (EIA) Regulations, 2014 (as amended in 2021) published in Government Notice Regulation (GNR) 324 - GNR 327, in terms of Section 24(5) of the National Environmental Management Act - NEMA (Act No. 107 of 1998) (as amended) of the initiative by being undertaken by ACWA Power Project DAO (RF) Pty Ltd to develop two individual 9.9MW Internal Combustion Engines (ICE) associated with the Project DAO PV Plant on the Remaining Extent of the Farm Bokpoort 390 near Groblershoop.

Please find attached initial notification regarding the project.

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ETHIC Intelligence
CERTIFICATE 2014 ANTI-CORRUPTION COMPLIANCE SYSTEM
Audited by SGS

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Interested and Affected Parties

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Date:	05 November 2021	Contact name:	Seshni Govender
Your reference:		Telephone:	087 352 1592
Our reference:	MD4195-RHD-ZZ-XX-CO-Z-0001	Email:	seshni.govender@rhdhv.com
Classification:	Project related		

THE DEVELOPMENT OF TWO 9.9MW INTERNAL COMBUSTION ENGINES ASSOCIATED WITH THE PROJECT DAO PHOTOVOLTAIC (PV) PLANT ON THE REMAINING EXTENT OF THE FARM BOKPOORT 390 NEAR GROBLERSHOOP WITHIN THE !KHEIS LOCAL MUNICIPALITY IN THE NORTHERN CAPE PROVINCE

Dear Interested & Affected Party

ACWA Power Project DAO (RF) Pty Ltd (hereafter referred to as ACWA Power) is proposing to develop two individual 9.9MW Internal Combustion Engines (ICE) associated with the Project DAO PV Plant on the Remaining Extent of the Farm Bokpoort 390 near Groblershoop.

Project Description

In May 2021, ACWA Power was issued with seven Environmental Authorisations (EAs) for the development of seven individual 9.9MW Internal Combustion Engines (ICE) on the authorised Pedi, Venda, Zulu, Afrikaans, Ndebele, Swati and Sotho Photovoltaic (PV) Plants on the Remaining Extent (RE) of the Farm Bokpoort 390, located 20km north west of the town of Groblershoop within the !Kheis Local Municipality in the ZF Mgcawu District Municipality, Northern Cape Province.

The EAs issued per PV plant were as follows:

- Zulu ICE (Ref 14/12/16/3/3/1/2295);
- Venda ICE ((Ref 14/12/16/3/3/1/2296);
- Swati ICE ((Ref 14/12/16/3/3/1/2297);
- Sotho ICE (Ref 14/12/16/3/3/1/2298);
- Pedi ICE (Ref 14/12/16/3/3/1/2299);
- Ndebele ICE (Ref 14/12/16/3/3/1/2300); and
- Afrikaans ICE (Ref 14/12/16/3/3/1/2301).

PV can only generate electricity when the weather is favourable. In order to address this need, ACWA Power proposed additional infrastructure ICE within their authorised plants to create flexibility and efficiency within the plants which will enable electricity generation during unfavourable weather conditions.

In September 2020, the Department of Mineral Resources and Energy released a request for proposal as part of the Risk Mitigation Independent Power Producer Procurement Programme to reduce the current load shedding periods being experienced by the country. In responding to the request, ACWA Power submitted a bid for a 150MW (export capacity) PV plant that was bid as “Project DAO” and were successful. A condition in the Request For Proposal required Bidders to not tap into the national grid for power and requires that a reliability test be undertaken at a specified generation rate and time.

However, the DMRE informed bidders that these requirements would be relaxed, and ACWA Power decided to lapse four of the seven ICE EAs, the four EAs that have been lapsed are Zulu, Afrikaans, Sotho, and Swati PV Plant ICE. The DMRE has now confirmed that they are not relaxing the reliability run requirements, and as such, ACWA Power now needs two (2) additional ICE infrastructure to meet these requirements.

The specifications of each of the ICE are provided below:

- Generating capacity: 9.9 MW
- Fuel Type: Diesel or LPG/ NG
- Stack height: 5 - 30 m
- Number of engines for each plot: 2 - 15 (it is subject to the engine size, various load size available in the market)
- Fuel storage tanks for each plot: 6 - 30 (it is subject to the tanks sizing/designing)
- Fuel volume for each plot: 500 m^3
- Water requirements: limited water for cooling
- Area size: 2 ha

Refer to Figure 1 for the locality map showing the proposed infrastructure.

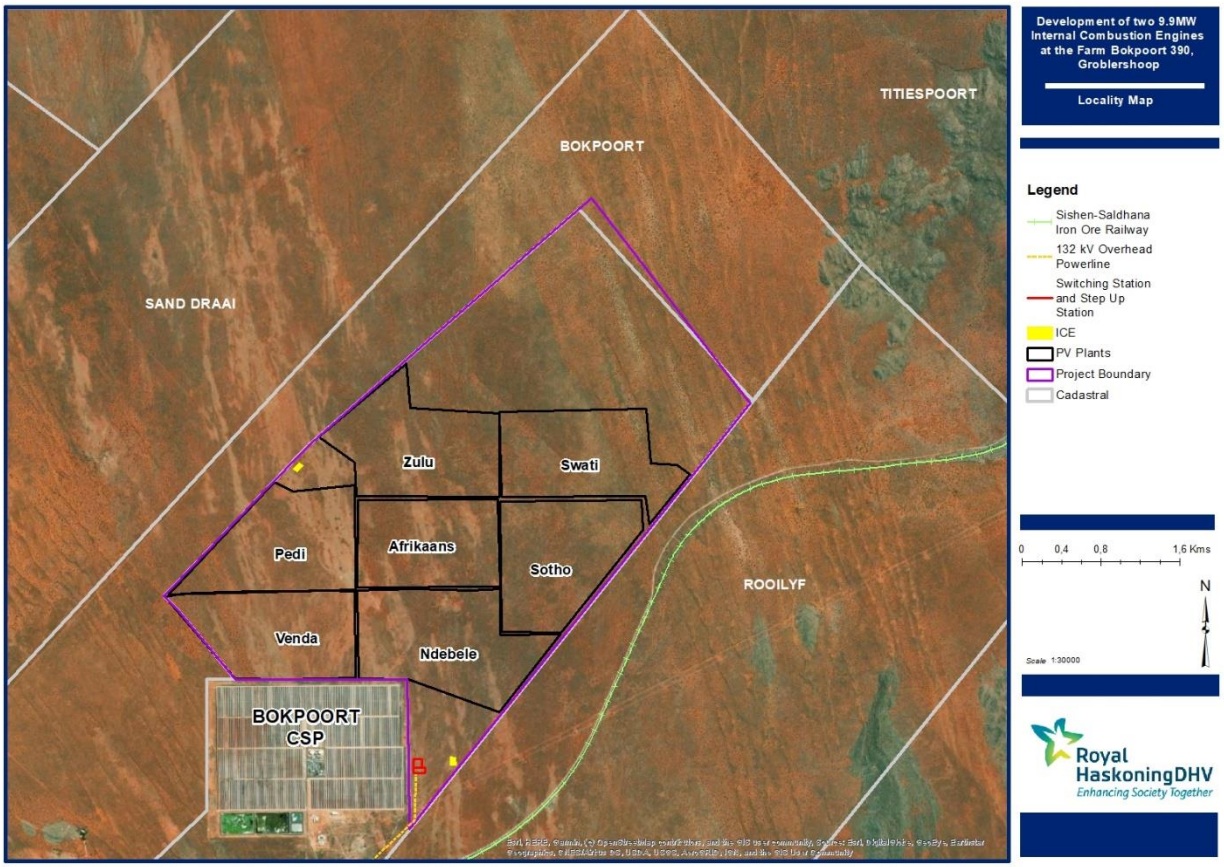

Figure 1: Locality map of proposed additional ICEs

What are the Potential Environmental Impacts associated with the Proposed Project?

A number of potential environmental impacts associated with the project have been identified. Various specialist assessments have been conducted for the previous applications for EAs i.e. Seven (7) ICE developments and will be revised and updated based on additional new infrastructure. The following specialist studies have been undertaken or updated: Agriculture, Biodiversity, Heritage, Palaeontology, Noise, Air Quality and Visual.

Why are Environmental Studies Needed?

In terms of the Environmental Impact Assessment (EIA) Regulations Government Notice Regulation (GNR) 324 – 327, published in terms of Section 24(5), and read with Section 44, of the National Environmental Management Act (NEMA) (Act No. 107 of 1998), ACWA Power requires an Environmental Authorisation for the ICE from the Department of Forestry, Fisheries and the Environment (DFFE) for undertaking the proposed project as it includes activities listed under Listing Notices 1 of the EIA Regulations 2014 (as amended).

Listing Notice	Activity Number	Description and Applicability
1 (GNR 327)	2	The development and related operation of facilities or infrastructure for the generation of electricity from a non-renewable resource where – (ii) the output is 10MW or less but the total extent of the facility covers an area in excess of 1ha.

Listing Notice	Activity Number	Description and Applicability
		Applicable to the development and operation of the ICE with the total generating capacity of 9.9MW to be developed on an area of 4ha (2ha per ICE).
1 (GNR 327)	14	The development and related operation of facilities or infrastructure, for the storage, or for the storage and handling of, a dangerous good, where such storage occurs in containers with a combined capacity of 80 cubic metres or more but not exceeding 500 cubic metres. *Liquified Natural Gas or Liquified Petroleum Gas or diesel will be stored in 6 - 30 storage tanks with a combined volume of not exceeding 500m^3.*
1 (GNR 327)	27	The clearance of an area of 1ha or more, but less than 20ha of indigenous vegetation, except where such clearance of indigenous vegetation. *The construction of the proposed 9.9MW ICE will require the clearance of 4ha (2ha per ICE) of indigenous vegetation.*
1 (GNR 327)	28	Residential, mixed, retail, commercial, industrial or institutional developments where such land was used for agriculture on or after 01 April 1998 and where such development will occur outside an urban area, where the total land to be developed is bigger than 1ha. *The 9.9MW ICE will entail the development on 4ha (2ha per ICE) of agricultural land. The project site is located outside an urban area.*

A Basic Assessment study as contemplated in Regulation 19 and 20 of the EIA Regulations 2014 (as amended), must be followed in order to obtain environmental authorisation.

A BA is an effective planning and decision-making tool, which allows for the identification of potential environmental consequences of a proposed project, and its management through the planning process.

ACWA Power has appointed Royal HaskoningDHV to provide independent Environmental Assessment Practitioner (EAP) services for the proposed project. As part of these environmental studies, all I&APs will be actively involved through a public participation process (PPP).

The PPP entails informing the local authorities, Interested and Affected Parties (I&APs), key stakeholders and landowners about the proposed project.

You can register as an Interested and Affected Party (I&AP) or request additional information by:

- Contacting the public participation consultant directly (contact details provided below), or
- Submitting written comments to Royal HaskoningDHV (*via* post or e-mail).

I&APs are requested to provide their name and surname, contact information and interest in the project to the environmental consultant. Kindly note that I&APs will be notified in due course of the availability of the draft report for public review.

Details of Public Participation Consultant:
Seshni Govender
E-mail seshni.govender@rhdhv.com
PO Box 867 Gallo Manor 2052
Tel | 087 352 1592

Seshni Govender

Environmental Consultant
Southern Africa

NOTICE OF APPLICATION FOR ENVIRONMENTAL AUTHORISATIONS

BASIC ASSESSMENT STUDY FOR THE DEVELOPMENT OF TWO 9.9MW INTERNAL COMBUSTION ENGINES ASSOCIATED WITH THE PROJECT DAO PHOTOVOLTAIC (PV) PLANT ON THE REMAINING EXTENT OF THE FARM BOKPOORT 390 NEAR GROBLERSHOOP WITHIN THE !KHEIS LOCAL MUNICIPALITY IN THE NORTHERN CAPE PROVINCE

NOVEMBER 2021

DFFE REFERENCE NUMBERS: TBC

Notice is hereby given in terms of the Environmental Impact Assessment (EIA) Regulations, 2014 (as amended) published in Government Notice Regulation (GNR) 324 - GNR 327, in terms of Section 24(5) of the National Environmental Management Act - NEMA (Act No. 107 of 1998) (as amended) of the initiative by **ACWA Power Project DAO (RF) Pty Ltd (ACWA Power), to apply for environmental authorisations** for the proposed development of two individual 9.9MW Internal Combustion Engines (ICE) associated with the Project DAO PV Plant on the remaining extent of the farm Bokpoort 390, !Kheis Local Municipality.

With respect of the above, the Applicant, ACWA Power intends undertaking a **Basic Assessment (BA) study** as contemplated in the EIA Regulations, 2014 (as amended) for the process of applying for authorisations for the above proposed developments to the Competent Authority, the **Department of Forestry, Fisheries and the Environment (DFFE)**.

Name of Applicant	ACWA Power Project DAO (RF) Pty Ltd
Project Name	BASIC ASSESSMENT PROCESS FOR THE DEVELOPMENT OF TWO 9.9MW INTERNAL COMBUSTION ENGINES ASSOCIATED WITH THE PROJECT DAO PHOTOVOLTAIC (PV) PLANT FACILITY ON THE REMAINING EXTENT OF THE FARM BOKPOORT 390 NEAR GROBLERSHOOP WITHIN THE !KHEIS LOCAL MUNICIPALITY IN THE NORTHERN CAPE PROVINCE
District and Local Authorities	District: ZF Mgcawu District Municipality Local: !Kheis Local Municipality
Project Nature	The specifications of each ICE are provided below: ▪ Generating capacity: 9.9MW ▪ Fuel type: Diesel or Liquified Petroleum Gas (LPG) or Natural Gas (NG) ▪ Stack height: 5 – 30m ▪ Number of engines: 2 - 15 (it is subject to the engine size, various load size available in the market) ▪ Fuel storage tanks: 6 – 30 ▪ Total fuel volume: 500m^3 ▪ Water requirements: limited water for cooling ▪ Footprint: 2ha
Project Location & Coordinates	The study area is situated approximately 19 km from the Orange River, located 19.55 km north-west of Groblershoop and 13.94 km north-west of the N8. The site is surrounded by vacant and agricultural land. The study area is located in one of the Renewable Energy Development Zones. The coordinates for the ICE per site are included below. ICE 1: A: 28°41'59.32"S, 21°59'40.32"E; B: 28°42'0.40"S, 21°59'41.84"E; C: 28°42'2.56"S, 21°59'39.84"E; D: 28°42'1.47"S, 21°59'38.33"E ICE 2: A: 28°43'36.42"S, 22° 0'30.01"E; B: 28°43'36.42"S; 22° 0'31.97"E C: 28°43'39.21"S, 22° 0'31.96"E; D: 28°43'39.22"S, 22° 0'30.00"E
Property Details	Remaining Extent of the Farm Bokpoort 390
Competent Authority	Department of Forestry, Fisheries and the Environment
Listed Activities	The following listed activities will be applied for: ▪ Listing Notice 1 - GNR 327: Activity 2, 14, 27 and 28.
How to Register	You can register as an Interested and Affected Party (I&AP) or request additional information by: ▪ Contacting the public participation consultant directly (contact details provided below), or ▪ Submitting comments to Royal HaskoningDHV (*via* post, telephone or e-mail). I&APs are requested to provide their name and surname, contact information and interest in the project to the environmental consultant. Kindly note that I&APs will be notified in due course of the availability of the draft report for public review.
Public Participation Consultant	Seshni Govender E-mail seshni.govender@rhdhv.com PO Box 867 Gallo Manor 2052 Tel | 087 352 1592

From: Seshni Govender
To: [redacted]
Cc:
Subject: Reminder of Availability of BAR: The Development of two 9.9MW ICEs associated with the Project DAO PV Facility on the Remaining Extent of the Farm Bokpoort 390, !Kheis Local Municipality
Date: Friday, 04 February 2022 12:22:00
Importance: High

Dear Stakeholder

This serves as a reminder comments are due for the above mentioned project today 04 February 2022.

The report is available electronically on the following link:
https://global.royalhaskoningdhv.com/countries/southern-africa/environmental-reports

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PO Box 867, Gallo Manor, 2052, Gauteng, South Africa

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Bcc:
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Date: Friday, 04 February 2022 12:23:00
Importance: High

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Dear Ms Moleko

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Royal HaskoningDHV
Enhancing Society Together

Interested and Affected Party

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Date:	06 December 2021	Contact name:	Seshni Govender
Your reference:		Telephone:	087 352 1592
Our reference:	MD4195-RHD-ZZ-XX-CO-Z-0001	Email:	seshni.govender@rhdhv.com
Classification:	Project related		

Development of two 9.9MW Internal Combustion Engines associated with the previously authorised Afrikaans and Sotho Photovoltaic (PV) Plant on the Remaining Extent of the Farm Bokpoort 390 near Groblershoop within the !Kheis Local Municipality in the Northern Cape Province.

In May 2021, ACWA Power was issued with seven Environmental Authorisations (EAs) for the development of seven individual 9.9MW Internal Combustion Engines (ICE) on the authorised Pedi, Venda, Zulu, Afrikaans, Ndebele, Swati and Sotho Photovoltaic (PV) Plants on the Remaining Extent (RE) of the Farm Bokpoort 390, located 20km north west of the town of Groblershoop within the !Kheis Local Municipality in the ZF Mgcawu District Municipality, Northern Cape Province.

The EAs issued per PV plant were as follows:

- Zulu ICE (Ref 14/12/16/3/3/1/2295);
- Venda ICE ((Ref 14/12/16/3/3/1/2296);
- Swati ICE ((Ref 14/12/16/3/3/1/2297);
- Sotho ICE (Ref 14/12/16/3/3/1/2298);
- Pedi ICE (Ref 14/12/16/3/3/1/2299);
- Ndebele ICE (Ref 14/12/16/3/3/1/2300); and
- Afrikaans ICE (Ref 14/12/16/3/3/1/2301).

PV can only generate electricity when the weather is favourable. In order to address this need, ACWA Power proposed additional infrastructure ICE within their authorised plants to create flexibility and efficiency within the plants which will enable electricity generation during unfavourable weather conditions.

In September 2020, the Department of Mineral Resources and Energy (DMRE) released a request for proposal as part of the Risk Mitigation Independent Power Producer Procurement Programme to reduce the current load shedding periods being experienced by the country. In responding to the request, ACWA Power submitted a bid for a 150MW (export capacity) PV plant that was bid as “Project DAO” and were successful. A condition in the Request For Proposal required Bidders to not tap into

the national grid for power and requires that a reliability test be undertaken at a specified generation rate and time.

However, the DMRE informed bidders that these requirements would be relaxed, and ACWA Power decided to lapse four of the seven ICE EAs, the four EAs that have been lapsed are Zulu, Afrikaans, Sotho, and Swati PV Plant ICE. The DMRE has now confirmed that they are not relaxing the reliability run requirements, and as such, ACWA Power needs two additional ICE to meet these requirements. Individual applications for Environmental Authorisation will be lodged for the 9.9MW ICE within the Afrikaans and Sotho previously approved PV plants on the Bokpoort Farm, however, the Basic Assessment (BA) study is applicable to the entire development of the two individual ICE.

The proposed positions of the ICE were planned taking into account the layout of other approved infrastructure e.g. PV plants and access routes, which will have to undergo an amendment process hence the map provided in the correspondence dated 05 November 2021 (**Figure 1**) has been updated to show the revised position of these two ICE (**Figure 2**) and subject to applications for Environmental Authorisation.

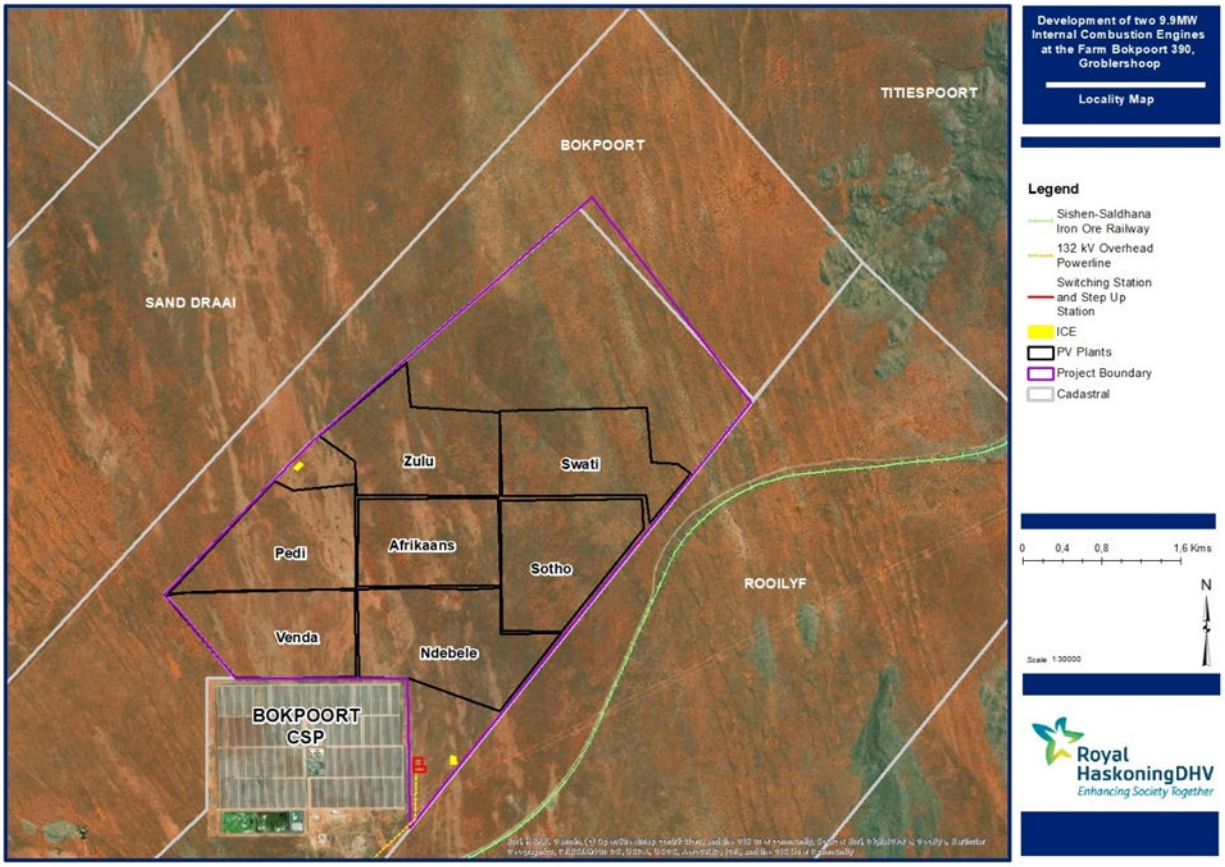

Figure 1: Original Layout as per the Initial correspondence (05 November 2021)

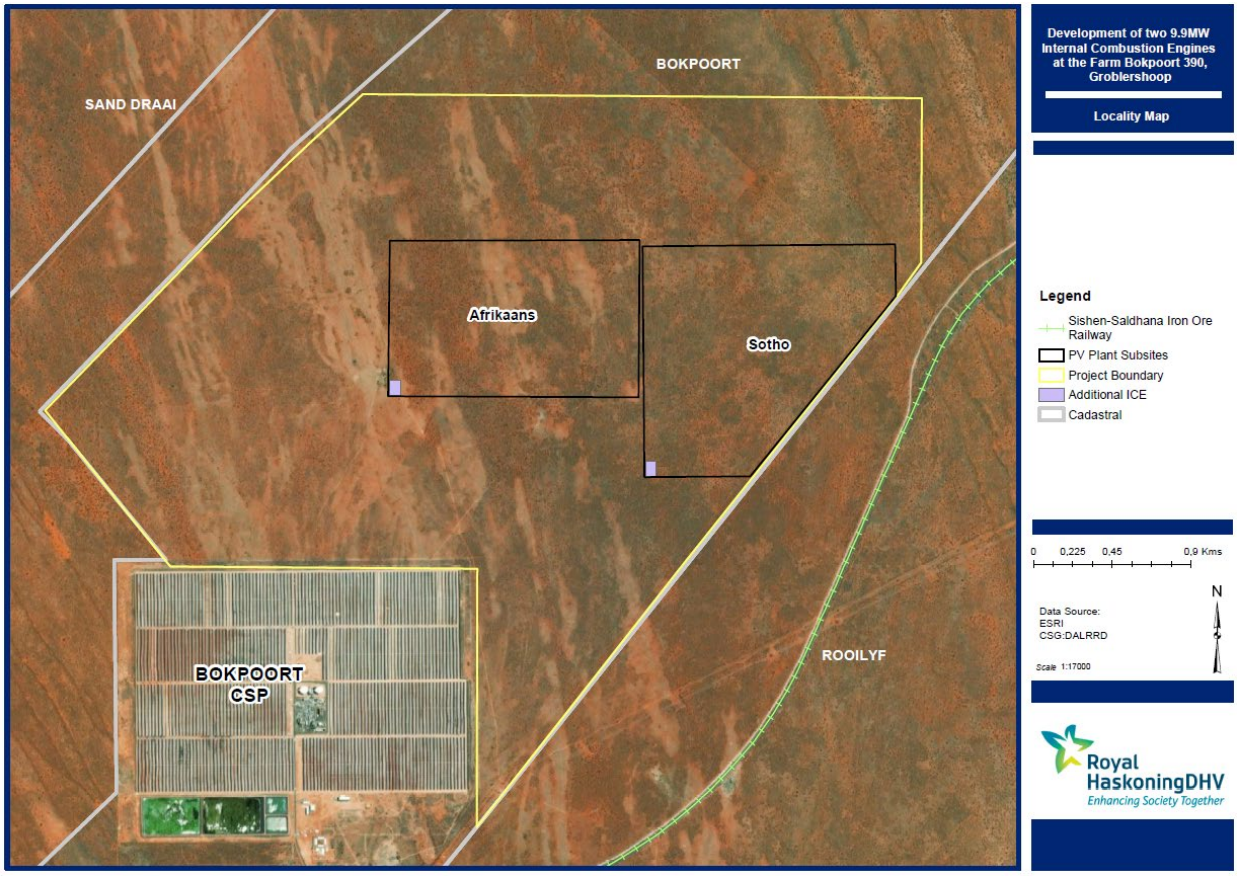

Figure 2: Revised Layout for the additional ICEs

The specifications for each of the ICE associated with the Afrikaans and Sotho PV Plant are provided below:

- Generating capacity: 9.9 MW
- Fuel Type: Diesel or Liquified Petroleum Gas (LPG) or Liquified Natural Gas (LNG)
- Stack height: 50 - 70 m
- Number of engines for the ICE: 1 (it is subject to the engine size, various load size available in the market)
- Fuel storage tanks: 5 (subject to the tanks sizing/designing)
- Fuel volume: 500 m3
- Water requirements: limited water for cooling
- Area size: 0.5 ha

The draft consultation Basic Assessment Report and Environmental Management Programme are now available for review and comment from 14 December – 04 February 2021 (excluding 15 December 2021-05 January 2022). Please can we have comments on or before 04th February 2021.

The report is available electronically on the following link:
https://global.royalhaskoningdhv.com/countries/southern-africa/environmental-reports

Hard copies of the Report are also available:
97 Oranje Street, Groblershoop:

- !Kheis Local Municipality Municipal Offices

- !Kheis Public Library

Details of Public Participation Consultant:
Seshni Govender
E-mail seshni.govender@rhdhv.com
PO Box 867 Gallo Manor 2052
Tel | 087 352 1592

Seshni Govender

Environmental Consultant
Southern Africa

AppendixD: Proof of Comments

From: Seshni Govender
To: [redacted]
Cc:
Subject: RE: The Development of two 9.9MW ICEs associated with the Project DAO PV Facility on the Remaining Extent of the Farm Bokpoort 390, !Kheis Local Municipality
Date: Monday, 08 November 2021 09:44:00
Attachments: Additional ICE.kmz

Hi John

I will forward the requirements to the applicant, please find attached the KMZ for the additional ICE's as requested.

Regards
Seshni

From: [redacted]
Sent: Monday, 08 November 2021 09:34
To: Seshni Govender <seshni.govender@rhdhv.com>
Subject: RE: The Development of two 9.9MW ICEs associated with the Project DAO PV Facility on the Remaining Extent of the Farm Bokpoort 390, !Kheis Local Municipality

Please find attached Eskom general requirements for works at or near Eskom infrastructure and servitudes. Please send me a KMZ file of the proposed development footprints of the ICE's.

Kind regards

From: Seshni Govender <seshni.govender@rhdhv.com>
Sent: Friday, 05 November 2021 15:56
Cc: [redacted]
Subject: [CAUTION:EXTERNAL EMAIL] - The Development of two 9.9MW ICEs associated with the Project DAO PV Facility on the Remaining Extent of the Farm Bokpoort 390, !Kheis Local Municipality
Importance: High

Royal HaskoningDHV
Enhancing Society Together

Dear Stakeholder

Notice is hereby given in terms of the Environmental Impact Assessment (EIA) Regulations, 2014 (as amended in 2021) published in Government Notice Regulation (GNR) 324 - GNR 327, in terms of Section 24(5) of the National Environmental Management Act - NEMA (Act No. 107 of 1998) (as amended) of the initiative by being undertaken by ACWA Power Project DAO (RF) Pty Ltd to develop two individual 9.9MW Internal Combustion Engines (ICE) associated with the Project DAO PV Plant on the Remaining Extent of the Farm Bokpoort 390 near Groblershoop.

Please find attached initial notification regarding the project.

In accordance with the Protection of Personal Information (POPI) Act, your details will be securely stored and will not be shared with any third parties. If you wish to be removed from this database, please send an email to: seshni.govender@rhdhv.com.

Regards

Seshni Govender (*Pr. Sci. Nat.*)
Environmental Consultant

D 087 352 1592 | **E** seshni.govender@rhdhv.com | **W** www.rhdhv.co.za
Royal HaskoningDHV (Pty) Ltd trading as Royal HaskoningDHV | Reg No. 1966/001916/07
Building No. 5 Country Club Estate, 21 Woodlands Drive, Woodmead, 2191
PO Box 867, Gallo Manor, 2052, Gauteng, South Africa

Please, consider your environment.
Before printing this e-mail ask yourself: "Do I need a hard copy?"

Proposed Development of Two 9.9MW Internal Combustion Engines (ICE) associated with the Afrikaans and Sotho PV Plants on the Remaining Extent of Farm Bokpoort 390, Groblershoop, Northern Cape
Our Ref:

an agency of the
Department of Arts and Culture

T: +27 21 462 4502 | F: +27 21 462 4509 | E: info@sahra.org.za
South African Heritage Resources Agency | 111 Harrington Street | Cape Town
P.O. Box 4637 | Cape Town | 8001
www.sahra.org.za

CaseID: 17809

Date: Friday February 11, 2022

Final Comment

In terms of Section 38(4), 38(8) of the National Heritage Resources Act (Act 25 of 1999)

Attention: ACWA Power Energy Africa (Pty) Ltd

In September 2020, the Department of Mineral Resources and Energy (DMRE) released a request for proposal as part of the Risk Mitigation Independent Power Producer Procurement Programme to reduce the current load shedding periods being experienced by the country. ACWA Power Project DAO (RF) Pty Ltd (hereafter referred to as ACWA Power) submitted a bid for a 150MW (export capacity) PV plant that was bid as "Project DAO" and were successful. A condition in the RFP requires Bidders to not tap into the national grid for power and requires that a reliability test be undertaken at a specified generation rate and time. In meeting the RFP requirements, ACWA Power decided to supplement their already authorised project infrastructure by adding ICE infrastructure in the projects which was applied for and then authorised. The DMRE relaxed the reliability run requirements, and ACWA Power decided to lapse four (Zulu, Afrikaans, Sotho and Swati PV plant ICE) of the seven ICE EAs. The DMRE has now confirmed that they are not relaxing the reliability run requirements, and as such, ACWA Power needs two additional ICE to meet these requirements. Individual applications for Environmental Authorisation will be lodged for the 9.9MW ICE within the Afrikaans and Sotho previously approved PV plants on the Bokpoort Farm 390, !Kheis Local Municipality, Northern Cape.

Royal Haskoning DHV have been appointed by ACWA Power Project DAO (RF) Pty Ltd to conduct an Environmental Authorisation (EA) Application for the proposed development of two 9.9 MW Internal Combustion Engines (ICE) associated with the Afrikaans and Sotho PV Plants on the remaining extent of Farm Bokpoort 390, Groblershoop, Northern Cape Province.

A draft Basic Assessment Report (DBAR) has been submitted in terms of the National Environmental Management Act, 1998 (NEMA) and the 2017 NEMA Environmental Impact Assessment (EIA) Regulations. The proposed development will include the construction of two ICE's with a footprint of 0.5 ha each, within the already authorised footprints.

It is noted that SAHRIS Case ID 14976
(
https://sahris.sahra.org.za/cases/basic-assessment-processes-eight-new-photovoltaic-pv-plants-well-increase-capacity-and) and SAHRIS Case ID 15900

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https://sahris.sahra.org.za/cases/basic-assessment-proposed-development-seven-99mw-internal-combustion-engines-ice-remaining) are linked to the current application. SAHRA noted no objections to the previous applications and provided conditions.

Natura Viva CC and Dr Van Schalkwyk were appointed to provide heritage specialist input as required by section 24(4)b(iii) of NEMA and section 38(8) of the National Heritage Resources Act, Act 25 of 1999 (NHRA).

Almond, J. E. 2021. Addendum: Revised layout of ICE for the authorised Bokpoort Solar Power Facility (Project DAO) near Groblershoop, Northern Cape Province.

The specialist confirmed that the new layout of the ICE will not change the significance rating of the original Palaeontological Impact Assessment and no additional impacts are expected. The mitigation measures in the original report remain valid.

Van Schalkwyk, J. 2021. Specialist Opinion for the new Internal Combustion Engine (ICE) Developments associated with the Afrikaans and Sotho PV Plant for Project Dao (Formerly Bokpoort Solar Photovoltaic (Pv) Energy Facility) near Groblershoop, !Kheis Local Municipality, Northern Cape Province.

The specialist confirmed that the proposed amendments of the ICE will not increase the level or nature of impacts that were initially assessed, and no additional impacts are expected. The mitigation measures in the original report remain valid.

Final Comment

The following comments are made as a requirement in terms of section 3(4) of the NEMA Regulations and section 38(8) of the NHRA in the format provided in section 38(4) of the NHRA and must be included in the Final BAR and EMPr:

- 38(4)a – The SAHRA Archaeology, Palaeontology and Meteorites (APM) Unit has no objections to the proposed development;
- 38(4)b – The recommendations of the specialists are supported and must be adhered to. No further additional specific conditions are provided for the development;
- 38(4)c(i) – If any evidence of archaeological sites or remains (e.g. remnants of stone-made structures, indigenous ceramics, bones, stone artefacts, ostrich eggshell fragments, charcoal and ash

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concentrations), fossils or other categories of heritage resources are found during the proposed development, SAHRA APM Unit (Natasha Higgitt/Phillip Hine 021 462 5402) must be alerted as per section 35(3) of the NHRA. Non-compliance with section of the NHRA is an offense in terms of section 51(1)e of the NHRA and item 5 of the Schedule;

- 38(4)c(ii) – If unmarked human burials are uncovered, the SAHRA Burial Grounds and Graves (BGG) Unit (Thingahangwi Tshivhase/ Ngqalabutho Madida 012 320 8490), must be alerted immediately as per section 36(6) of the NHRA. Non-compliance with section of the NHRA is an offense in terms of section 51(1)e of the NHRA and item 5 of the Schedule;
- 38(4)d – See section 51 of the NHRA regarding offences;
- 38(4)e – The following conditions apply with regards to the appointment of specialists:
- With reference to the mitigation work noted above, a qualified archaeologist must be appointed to undertake the work in terms of the permit applied for as noted above;
- If heritage resources are uncovered during the course of the development, a professional archaeologist or palaeontologist, depending on the nature of the finds, must be contracted as soon as possible to inspect the heritage resource. If the newly discovered heritage resources prove to be of archaeological or palaeontological significance, a Phase 2 rescue operation may be required subject to permits issued by SAHRA;
- The Final BAR and EMPr must be submitted to SAHRA for record purposes;
- The decision regarding the EA Application must be communicated to SAHRA and uploaded to the SAHRIS Case application.

Should you have any further queries, please contact the designated official using the case number quoted above in the case header.

Yours faithfully

_____
South African Heritage Resources Agency

an agency of the
Department of Arts and Culture

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South African Heritage Resources Agency | 111 Harrington Street | Cape Town
P.O. Box 4637 | Cape Town | 8001
www.sahra.org.za

CaseID: 17809

Date: Friday February 11, 2022

South African Heritage Resources Agency

ADMIN:
Direct URL to case: https://sahris.sahra.org.za/node/591508
(DEA, Ref:)

Terms & Conditions:

1. This approval does not exonerate the applicant from obtaining local authority approval or any other necessary approval for proposed work.
2. If any heritage resources, including graves or human remains, are encountered they must be reported to SAHRA immediately.
3. SAHRA reserves the right to request additional information as required.

Appendix G:
Offset Feasibility Investigation

Ecological Management Services

Ecological Management Services

DRAFT

BIODIVERSITY OFFSET FEASIBILITY INVESTIGATION FOR THE ACWA POWER BOKPOORT SOLAR PROJECT NEAR GROBLERSHOOP NORTHERN CAPE

Prepared by Dr N. Birch *Pri.Sci.Nat*
Ecological Management Services

For
ENVIRONMENTAL IMPACT MANAGEMENT SERVICES (PROPRIETARY) LIMITED

May 2021

DECLARATION OF INDEPENDENCE

I, Natalie Birch, as duly authorized representative of Ecological Management Services (EMS), hereby confirm my independence, as well as that of the EMS as a specialist and declare that I do not have any interest, be it business, financial, personal or other, in any proposed activity, application or appeal in respect of which I was appointed as an Independent specialist, other than fair remuneration for work performed.

Natalie Birch Pr. Sci. Nat 

EXECUTIVE SUMMARY

Bokpoort CSP is a greenfield Independent Power Project (IPP) which is an integral part of South Africa's renewable IPP program. The site is located within one of South Africa's eight renewable energy development zones, on the remaining extent of the Farm Bokpoort 390, which is situated 20 km north-west of the town of Groblershoop within the !Kheis Local Municipality in the ZF Mgcawu District Municipality, Northern Cape Province

The Bokpoort project was initiated 10 years ago, with the planning for Bokpoort I, which covers just over 250ha and consists of a solar field of parallel rows of parabolic troughs, a power block, a thermal-energy storage system as well as a pipeline and abstraction point. Construction commenced in 2013, and the plant synchronized for the first time on the South African Grid in November 2015, after a construction period of 29 months. Subsequent to this an additional application was submitted for Bokpoort II, which consists of 10 Photo Voltaic plants and associated infrastructure which will cover 1500ha.

The area contains floral species of conservation concern most notably *Boscia albitrunca*, which is protected under the National Forest Act (Act 84 of 1998). Owing to the presence of species of conservation concern permit applications were made to allow for the removal of these species during the construction phase of Bokpoort I. One of the conditions stipulated in the tree removal license that was issued, was the requirement for the developer to implement a Biodiversity offset. This was supposed to have been concluded by the expiry date of the relevant license (31 December 2015).

A number of biodiversity options were put forward by the developer, however no formal arrangement has as yet been agreed upon by the DENC and Forestry with the developer for the required offset. In the meanwhile an application for the development of Bokpoort II has been submitted and additional permit applications will be required to remove additional species of conservation concern.

In order to move forward with this development the offset requirements need to be quantified for both Bokpoort I and Bokpoort II. Only once the size of the required offset has been calculated can a suitable offset option be determined. When the offset option has been approved then an implementation plan can be drawn up to facilitate the initiation of the offset.

Residual impacts are impacts that remain after mitigation and management measures have been implemented. It is only if there is an occurrence of unavoidable and residual impacts should an offset be considered.

Four of the impacts to the biodiversity listed in the EIA are assessed to show a moderated negative significance after mitigation, ie moderate residual impacts, these are

- Loss of habitats
- Loss/disturbance of flora and fauna species of conservation concern
- Direct loss (injury/mortality) of fauna species via roadkill

- Disturbance of faunal species of conservation concern – barrier to movement

The EIA however states that none of the anticipated impacts can be highlighted or construed to represent an unacceptable or severe threat to sensitive biological or biodiversity components within the study area and wider region. Ecological attributes and characteristics and biological components recorded on the site are regarded common and typical of the larger region and are not restricted to the site, i.e. no plant or animal species or habitat type will be affected in such a manner that the conservation status (local, regional, global) will be affected adversely. Although several species of conservation concern have been recorded within the study area, no species were recorded that would trigger 'Critical Habitat' as defined by IFC.

The EIA does nevertheless state that the high number of protected tree species recorded on the site would require legislative authorisation prior to removal

The walk-through surveys and the permit applications confirmed the following protected floral species would be lost as a result of the development

Species	Conservation Status	Bokpoort I		Bokpoort II	Total for permit applications
		Permit application	Removal register	Walk through survey	
Boscia albitrunca	LC	975	478	4350	5325
Vachelliai haematoxylon	LC	135	107	653	788
Vachellia erioloba	LC	45	31	394	439
Aloe claviflora	LC	2290	183*	552	2842
Euphorbia sp	LC	125	31*	5	130
Acanthopsis hoffmannseggiana	DDT	-	-	2607	-
Hoodia gordonii	DDD	-	-	4	4
Ruschia divaricata	LC	-	-	252	252

*Plants were relocated not destroyed

In terms of the definition for critical habitats as described by IFC's Performance Standard 6 (PS6) the following synthesis of site characteristics and the critical habitat criteria can be provided.

(i) Habitat of significant importance to Critically Endangered and/or Endangered species;

There are no Critically Endangered or Endangered, floral or faunal species located on or in the immediate vicinity of the site. This criterion is not triggered for the site.

(ii) Habitat of significant importance to endemic and/or restricted-range species;

The study area falls within the Griqualand West Centre of Endemism. Although the site occurs in a center of endemism, none of the floral SCC that occur within the study site are endemic to South Africa, and only one of the plants, *Vachellia haematxylon* occurs only in the Northern Cape, the other species all occur in at least one other province. *Vachellia haematoxylon* is the only species that may trigger this criterion, it does however occur in a number of other vegetation types across the Northern Cape and therefore it is unlikely that the development of the small area of duneveld for this project would trigger this criterion for this site.

There are however two plant species that are categorized as data deficient which means there is insufficient information on the species at present to estimate population status but they are both considered to be widespread. No SCC reptiles or mammals that occur on site are endemic to South Africa, although the scrub hare is endemic to Southern Africa

(iii) Habitat supporting globally significant concentrations of migratory species and/or congregatory

There are no migratory or congregatory species which are known to gather at the site. As such, the site is not considered important for any such species and this criterion is not triggered.

(iv) Highly threatened and/or unique ecosystems;

The National Biodiversity Assessment (NBA) is released every seven years and provides an assessment of South Africa's biodiversity and ecosystems. The current National Biodiversity Assessment (NBA) is the 2018 assessment. Ecosystem types are categorised as critically endangered (CR), endangered (EN), vulnerable (VU) or least concerned (LC), based on the proportion of each ecosystem type that remains in good ecological condition relative to a series of thresholds. Ecosystem protection level tells us whether ecosystems are adequately protected or under-protected. Ecosystem types are categorised as not protected, poorly protected, moderately protected or well protected, based on the proportion of each ecosystem type that occurs within a protected area recognised in the Protected Areas Act.

Ecosystem status is based on the percentage of original area remaining untransformed (in relation to the biodiversity target and a threshold for ecosystem functioning. Biodiversity target refers to the percentage of the original areas required to capture 75% of the species occurring in each vegetation type. The targets are aimed only at species conservation, and ecological processes are not considered. No significant disruption of ecosystem functioning is assumed in *least concerned* vegetation units, which still have more than 80% of their original extent untransformed.

According to the vegetation classification of Mucina & Rutherford (2006, BGIS vegetation map updated 2018), there are two vegetation types present within the CSP field (Bokpoort I) and the PV plants (Bokpoort II) –Kalahari Karroid Shrubland and Gordonia Duneveld. The pipeline and water abstraction point for Bokpoort I runs through Bushmanland Arid Grassland and the Lower Gariep Alluvial vegetation types.

The Kalahari Karroid Shrubland is listed as Least Concerned (NBA 2018). It is not well conserved, and its target is set at 21%. The Gordonia duneveld is listed as Least Concerned (NBA 2018). It is considered to be moderately protected with 14.8% formally conserved, the target is set at 16%. The Bushmanland Arid Grassland is listed as Least Concerned (NBA 2018) it is not well protected with 0.5% formally conserved and its target is set at 21%.

The Lower Gariep Alluvial is listed as Least Concerned (NBA 2018), however this vegetation type was listed as Endangered in the 2011 biodiversity assessment. There are ecosystem types which, based on the new land cover data, are in a lower threat category than the 2011 NEMBA assessment. In some cases this represents an improved understanding of the extent of natural habitat remaining, and in others it may be

that the new land cover data is over estimating the extent of natural habitat, therefore it is recommended that these ecosystems are investigated further and supplementary assessments should be undertaken to substantiate the change in threat category. As an endangered ecosystem this vegetation unit qualifies as critical habitat under Criterion 4. However, the abstraction point is located in an area that is already transformed by agricultural cultivation, and an existing abstraction point, and no longer supports natural vegetation; thus the area where the abstraction pipeline was placed is classified as modified habitat, and therefore cannot trigger this criterion.

The study area does not fall within a Freshwater Ecosystem Priority Area (FEPA) but it does fall within a fish support area. The study area does not overlap with any Important Bird Areas, or protected areas. In addition, the site is homogeneous and there are no unique or rare habitats or ecosystems within or in close proximity to the site, this criterion is not triggered at the site.

(v) Areas associated with key evolutionary processes.

The area around the Bokpoort site is not classified as a CBA, indicating that it has not been identified as being important for the maintenance of landscape connectivity and ecological processes. However parts of the pipeline and the abstraction point traverses a CBA, the presence of a CBA is considered to represent Critical Habitat for key Evolutionary Processes.

The quantum of biodiversity offsets in South Africa uses a basic ratio derived from a target which is in turn linked to the status of residually affected ecosystems. Multipliers are then applied to this basic ratio dependent on the onsite conditions, the affected biodiversity and the risks associated with the project. Ecosystem status is generally used to determine the basic offset ratio.

The Bokpoort CSP field and PV project area does not contain any Critically Endangered, Endangered or Vulnerable Ecosystems. All habitat types within this area are listed as Least Threatened. For Least threatened ecosystem offsets are not generally required. The abstraction point and some of the pipeline area however traverses an area classified as a CBA, the presence of a Critical Biodiversity Areas does trigger a requirement for an offset. The basic offset ratio for a CBA 1 is set at a ratio of 30:1 and up to 20:1 for a CBA 2.

Of particular concern is the substantial amount of *Boscia albitrunca* that will be lost as a result of this development. Offsets related to threatened species are usually not determined using an offset ratio but is guided by specific information on the species to inform an appropriate size and type of offset. However, very little research has been done on *Boscia albitrunca*, and thus questions remain on species occurrence (historical and current range), what its conservation status is and its population dynamics. Setting targets for species to determine an appropriate offset is not a simple task as it depends on many factors including the type of distribution data available as well as the taxa under consideration. Ideally species targets should be population level targets. In the absence of this information to set conservation targets for species, one can revert to the ecosystem data to facilitate setting these offset ratios. One would then need to consider

the ecosystem targets for the Kalahari Karroid shrubland and the Gordonia Duneveld in which this species occurs in the study area to determine offset ratios.

The required percentage of remaining habitat needed to meet the target is set at 21% for the Kalahari Karroid Shrubland and 16% for Gordonia Duneveld. A revised conservation target for this exercise could include the initial national target plus a buffer to ensure that no species within the habitat becomes endangered. A Basic Offset Ratio can then be assigned by reading it off against its corresponding target on the "No-Net- Loss up to a Target" graph. For example an adjusted target set at 50% for the Kalahari Karroid Shrubland would result in basic offset ratio of 1:1.

Offset ratios are subject to other influences which act as additional multipliers to the basic offset ratio. These multiplier factors include;

Risks and uncertainties – the basic offset ratio can be multiplied to accommodate uncertainty regarding impacts, the multiplier is determined by the amount of risk or uncertainty of an impact occurring. For instance, in habitats where a complete loss of relevant species due to vegetation clearing (such as under the PV plants) will occur uncertainty is not relevant in these cases and an additional multiplier will not be required.

Condition of habitat – this multiplier caters for differences in condition of the habitat impacted. If the habitat within a development area is significantly better than in the surrounding area then an additional multiplier would be applicable. For this project the condition of the habitat within the development area is not better than the surrounding areas. The area surrounding the abstraction point and the pipeline has been disturbed and most of the natural vegetation has been removed. The abstraction point is within an existing agricultural development, the pipeline for the most part runs along a railway line and gravel road, thus is considered to be more disturbed than the surrounding area. The property where the CSP plant and PV plants will be located is comparable in condition to the surrounding area. There are signs of over utilization on the property but it is not significantly different to the habitat in the immediate surrounds, thus an additional multiplier for habitat condition is not applicable, for any of the ecosystem units affected by the development.

Biodiversity priority – This multiplier recognizes biodiversity priority. It may also be necessary to cater for special habitats, or areas that contain a large number of protected species. In areas where a significant amount of threatened and/or protected species occur and will be lost an additional multiplier is required to account for this loss. This multiplier is relevant within the project development area where large numbers of SCC, most notably *Boscia albitrunca* will be lost from the site

The multipliers can then be applied to the basic offset ratio to obtain a final offset ratio, which is then multiplied by the area of disturbance within each ecosystem, to give the required offset area for the project.

The offset summary table is provided below

	Vegetation type	Conservation status	Conservation target NBA 2018	Critical Biodiversity Area	Residual loss (Ha)	Final Ratio	Offset required (Ha)
Bokpoort I	Kalahari Karroid Shrubland	Least Concerned	21%	NA	179,19803	2	358,39606
	Gordonia duneveld	Least Concerned	16%	NA	79,44154	1,5	119,16231
	Bushmanland arid grassland	Least Concerned	21%	CBA2	5,49305	20	109,861
	Lower Gariep Alluvial	LC/ Endangered	31%	CBA1	0,43401	30	13,0203
Bokpoort II	Kalahari Karroid Shrubland	Least Concerned	24%	NA	1243,12	2	2486,24
	Gordonia duneveld	Least Concerned	16%	NA	256,88	1,5	385,32
					1764,56663		**3471,99967**

The term 'No Net Loss' (NNL) is defined as the outcome of an offset where there would be no loss of a vegetation type, habitat or feature beyond the scientifically established conservation target for that feature. However, in the absence of regional fine scale mapping, the determination of No Net Loss is not possible at species level. No net loss of protected trees cannot be adequately tested as the extent of the resource is not known and has not been mapped or quantified. However as the vegetation types have been mapped and conservation targets set, it can be assumed that provision is made for a budget to ensure that the biodiversity values of that species, or habitat or feature, is maintained in the long term.

Internationally biodiversity offsets are currently used in reference to both like-for-like exchange for land, trading up to a higher conservation value habitat, and activities such as funding of biodiversity research, provision of financing for protected areas or support for capacity building in government agencies.

In order to establish what type of offset would be appropriate, a clear and valid purpose for the offset in broader conservation planning terms needs to be investigated. The next step in this offset process is the identification of a suitable offset with input from various stakeholders once this has been achieved a management and implementation plan can be produced for the approved offset.

There have been some attempts to implement a biodiversity offset for this project. A number of offset projects have been proposed by the developer and some contribution to other projects has already been undertaken. However, this was done without any quantification of the required offset, and some of the projects proposed owing to their nature cannot be regarded as offsets. These projects have included;

- The proposal to establish an Aloe garden
- The proposal to establish a seedling programme with Witsand Nature Reserve
- The contribution R150 000 towards the ADU TreeMAP project within the Northern Cape
- The contribution of R59 000 towards the CSP plant bird impact project, in partnership with UCT, Prof Peter Ryan and Birdlife SA
- The contribution of R66 000 towards a Graduate training programme
- The proposal of a tree greening programme for the !Kheis Municipal area
- The proposal of sponsorship of a nature reserve

All offset options must include both Bokpoort I and Bokpoort II, in terms of offset obligations. Once consensus has been reached by the various stakeholders in terms of determining offset size and appropriated offset (ie Like-for-like offset), the next step in the offset process will be the identification of a

suitable offset site. Once this has been achieved a management and implementation plan can be produced for the offset.

ACRONYMS & ABBREVIATIONS

BGIS	Biodiversity Geographical Information System
CBA	Critical Biodiversity Area
CITES	Convention on International Trade in Endangered Species
DAFF	Department of Agriculture, Forestry and Fisheries
DENC	Department of Environment and Nature Conservation
EIA	Environmental Impact Assessment
EWT	Endangered Wildlife Trust
FEPA	Freshwater Ecosystem Priority Areas
GPS	Global Positioning System
GWC	Griqualand West Centre of Endemism
IUCN	International Union for Conservation of Nature
NBA	National Biodiversity Assessment
NCNCA	Northern Cape Nature Conservation Act
NEM:BA	National Environmental Management: Biodiversity Act
NEMA	National Environmental Management Act
NFEPA	National Freshwater Ecosystem Priority Areas assessment
NPAES	National Protected Areas Expansion Strategy
PESEIS	Present Ecological State, Ecological Importance & Ecological Sensitivity
QDS	Quarter Degree Squares
SABAP	South African Bird Atlas Project
IBA	Important Bird and Biodiversity Area
SABIF	South African Biodiversity Information Facility
SANBI	South African National Biodiversity Institute
SARCA	Southern African Reptile Conservation Assessment
SCC	Species of Conservation Concern
SIBIS	SANBI's Integrated Biodiversity Information System
TOPS	Threatened or Protected Species
WMA	Water Management Area

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1. INTRODUCTION

1.1. BIODIVERSITY OFFSETS

Biodiversity offsets are measurable conservation outcomes resulting from actions designed to compensate for significant residual adverse biodiversity impacts arising from project development after appropriate prevention and MITIGATION measures have been taken. The goal of biodiversity offsets is to achieve NO NET LOSS and preferably a NET GAIN of biodiversity on the ground with respect to species composition, habitat structure, ecosystem function and people's use and cultural values associated with biodiversity.

Biodiversity loss is usually observed as one or both of: (1) reduced area occupied by species and community types and (2) reduced abundance of species or condition of communities & ecosystems. The likelihood of any biodiversity component persisting – or surviving – in the long term declines with both lower abundance and reduced habitat area. The relationship is far from linear and is highly variable across different biodiversity components. The loss of a species is the fundamental example of an irreversible loss of biodiversity

Priorities for BIODIVERSITY CONSERVATION are influenced by the concepts of IRREPLACEABILITY and VULNERABILITY. Biodiversity components that are highly irreplaceable and highly vulnerable are a top priority for conservation effort. Irreplaceability (or uniqueness) relates to the existence of additional spatial options available for conservation if the biodiversity at a particular site were irreversibly lost. Vulnerability indicates risk of imminent loss and so reflects the loss of conservation opportunities over time. The scientific concept of vulnerability includes a consideration of loss as the result of past, ongoing or future threats, and with irreplaceability, could be considered equivalent to the concept of 'hazard' used in corporate risk assessment. THREAT STATUS (of a species or community type) is a simple but highly integrated indicator of vulnerability.

The main concepts that arise when designing a biodiversity offset, include, when a biodiversity offset should be considered, how it should be measured, how suitable offset locations and activities can be selected, and how the offset should dovetail with an area's biodiversity priorities.

The role of biodiversity offsets is effectively as a 'last resort', after all reasonable measures have been taken first to avoid and minimise the impact of a development project and then to restore biodiversity on-site. Consequently, biodiversity offsets should only be applied to the residual adverse impacts of a project. The application of this mitigation hierarchy, and how far each step should be pursued before turning to the next is one of the key issues for consideration in biodiversity offset design.

When are offsets considered: Offsets tend to be required by a regulator, or considered by a project proponent, when the biodiversity that will be negatively impacted by a project is judged to be 'significant' in terms of its intrinsic or conservation value (e.g. globally threatened or locally endemic species; significant

concentrations or source populations; unique ecological communities), or when its loss is likely to have significant consequences in view of its use value (e.g. high level of dependence on that biodiversity for livelihoods). While the significance of impact on an environment is influenced by the sensitivity of the specific environment (and biodiversity offsets are therefore more likely to be considered in more sensitive environments), environmental sensitivity in itself is not the trigger for an offset. The trigger is whether the residual negative impact on biodiversity is of 'medium', 'medium – high' or 'high' significance

Quantified loss and gain: A feature that distinguishes offsets from other forms of ecological compensation is the requirement to demonstrate 'no net loss' or a 'net gain'. What this means and how to measure it lies at the heart of biodiversity offsetting. It is not always easy to determine what should be measured or accounted for in an offset. Biodiversity in its entirety is impossible to measure, so the process of offset design involves decisions about suitable 'metrics' or 'currencies'. As it is impossible to count every individual in every population of every species, and as no two sites are identical in biodiversity terms, the choice of metrics often involves selecting 'surrogates' or 'proxies' which can be quantified and which can be considered representative of 'overall' biodiversity. The extent to which the selected measures are genuinely representative of biodiversity overall may be difficult to demonstrate. It is also important to consider how similar the biodiversity structure, composition and function at an offset site needs to be to that affected by the development project for no net loss to be achieved. Exchange rules may be used to determine what levels of difference might be acceptable and to show how exchange between different sites will be accounted for in the metrics. Loss and gain also encompasses impacts on people's uses and cultural values associated with biodiversity. There are many possible approaches to designing, selecting and applying metrics appropriate for a given situation.

Habitat is a useful concept for loss / gain calculations, because it lends itself to identification of areas of land and uses these as a PROXY for 'carrying capacity' with respect to individual or multiple species. Most offset methods consider the areas of land available to key species, species populations or communities / assemblages and also the capacity of these areas to support them in a viable condition (generally referred to as 'habitat quality'). In this case, measures of area are generally combined with some measure of quality, health or condition of the habitat,

An offset should deliver CONSERVATION GAINS over and above what is already taking place or planned. A fundamental precept of biodiversity offsets is that they deliver results that would not have happened anyway in the absence of the offset. This means that calculations of loss and gain need to take into consideration the biodiversity BASELINE and trends.

1.2. PROJECT BACKGROUND

Bokpoort CSP is a greenfield Independent Power Project (IPP) which is an integral part of South Africa's renewable IPP program. The site is situated within one of South Africa's eight renewable energy development zones, and has therefore been identified as one of the most suitable areas in the country for renewable energy development.

The Bokpoort project was initiated 10 years ago, with the planning for Bokpoort I, which covers just over 250 ha and consists of a solar field of parallel rows of parabolic troughs, a power block, a thermal-energy storage system and related infrastructure. Construction commenced in 2013, and the plant synchronised for the first time on the South African Grid in November 2015, after a construction period of 29 months. Subsequent to this an additional application was submitted for Bokpoort II, which consists of 10 Photo Voltaic plants

The proposed individual 200 MW PV Solar Development will comprise of the following appurtenant infrastructure:

- Solar PV modules that will comprise of monocrystalline PV modules that will be able to deliver up to 200 MW to the Eskom National Grid;
- Inverters that convert direct current (DC) generated by the PV modules into alternating current (AC) to be exported to the electrical grid;
- A transformer that raises the system AC low voltage (LV) to medium voltage (MV). The transformer converts the voltage of the electricity generated by the PV panels to the correct voltage for delivery to Eskom;
- Transformer substation;
- Inclusion of a Battery Energy Storage System (BESS) on all 10 PV sites, with an anticipated storage capacity of 150 MW and a footprint of 16 ha on each of the 10 sites; and
- Instrumentation and control consisting of hardware and software for remote plant monitoring and operation of the facility.

Appurtenant infrastructure:

- Mounting structures for the solar panels;
- Cabling between the structures, to be lain underground where practical;
- A new 132 kV overhead power line which will connect the facility to the national grid via Eskom's existing Garona Substation;
- The powerline will be located within a servitude spanning 15.5 meters on both sides. The powerline towers will be 35 meters high; and
- Internal access roads (4 – 6 m wide) will be constructed where necessary, but existing roads will be used as far as possible, with appropriate fencing (approximately 3 m in height).
- Shared infrastructure consisting of buildings, including a workshop area for maintenance, storage (i.e. fuel tanks,etc.), laydown area, parking, warehouse, and offices (previously approved).

During the construction of the ACWA Power Bokpoort photovoltaic plants, the site will be cleared and all vegetation removed from the site.

The development area is situated on the remaining extent of the Farm Bokpoort 390, which is situated 20 km north-west of the town of Groblershoop within the !Kheis Local Municipality in the ZF Mgcawu District Municipality, Northern Cape Province. The proposed total photovoltaic development will cover 1,500ha in totality (development footprint).

The area contains a significant amount of species of conservation concern most notably *Boscia albitrunca*. In order to remove SCC permission must be granted in the form of permits. In the Northern Cape, environmental permitting is regulated through a central integrated permit office managed by DENC which regulates both national and provincial requirements. As such an integrated permit application is required for protected species. In addition to this application a separate application in terms of the Foresty Act (Act 84 of 1998) for the protected trees must be submitted to remove or damage any protected trees.

A number of permits were granted by DENC for the first phase of this project Bokpoort I, these included Permit FLORA 114/2/2011 that was issued on 28 August 2012 and was valid from: 28 August 2012 to 28 August 2013. A permit (NCU 2701012) was granted by the Department of Agriculture, Forestry and Fisheries for the removal of protected trees and was valid from 1 November 2012 to 31 December 2015. A condition of this permit was the developer should undertake a biodiversity offset to compensate for the loss of the protected trees.

During clearing activities related to the construction phase of Bokpoort I a number of SCC were rescued from the construction area and relocated.

1.2.1. SCOPE OF THIS REPORT

This report investigates the need for an offset, proposes appropriate metrics and multipliers for an offset, in order to calculate the require offset size for this development, so that suitable offset options can be explored. It has been undertaken in accordance with the Draft National Biodiversity Offset Policy (DEA 2017) and the Business and the Biodiversity Offset Design Handbook (BBOP 2012a).

1.3. OFFSET POLICY FRAMEWORK

1.3.1. INTERNATIONAL GUIDELINES FOR BIODIVERSITY OFFSETS

A biodiversity offset is:
"the measurable conservation outcomes resulting from actions designed to compensate for significant negative residual impacts on biodiversity arising from project development after appropriate prevention and mitigation measures have been taken" (BBOP 2012a)

Biodiversity offsets can encompass spatial patterns of biodiversity and the ecological processes that maintain those patterns, as well as people's use and cultural values associated with that biodiversity (ecosystem services). Our ecosystems create landscapes of aesthetic and natural heritage value; any cultural landscape and associated heritage depends in part on conservation of these natural systems. Impacts on biodiversity and ecosystems affect water resources either in terms of quality or flow, and thus also water users. Likewise, biodiversity offsets – in particular involving riparian and freshwater ecosystems – can be designed to benefit water resources and users in addition to the ecosystem itself.

Offsetting ecosystem service impacts can, however, have undesirable outcomes if the biodiversity or ecological process responsible for the original service is lost due to a development, and the service is effectively replaced with artificial provisions. It is important to ensure that ecosystem service offsets do not compromise or are not traded off for the original biodiversity and/or ecological processes being lost. Moreover, only ecosystem services that flow directly from the biodiversity or ecological process should be considered for offsets, and all ecosystem service offsets should aim to improve those services by enhancing the underlying biodiversity or process.

The most detailed international development of the biodiversity offset concept is outlined in the 2012 Business and Biodiversity Offset Programme (BBOP 2012a). This provides a coherent set of principles, criteria and indicators for offsets, as well as a range of tools and metrics for pursuing defensible offset projects. As far as possible, this study has followed the BBOP approach, except in one or two technical details which flow from the specific regulatory context and biodiversity planning and assessment tools used in South Africa.

1.3.2. LEGAL AND POLICY FRAMEWORK FOR BIODIVERSITY OFFSETS IN SA

Legislation

The Constitution of South Africa requires that development be 'ecologically sustainable'. The principles in the National Environmental Management Act 107 of 1998 (NEMA) state that the environment is held in public trust for the people, and must be protected as the 'people's common heritage'. The principles point to the need to conserve biodiversity and ecological integrity and, where impacts on biodiversity and disturbance to ecosystems cannot be altogether avoided, they must be minimized and remedied. Further, the principles reflect the 'mitigation hierarchy', and state that the party who causes environmental damage is responsible for 'paying' or remedying that damage. Finally, the NEMA principles advocate a 'risk-averse and cautious approach' where we are uncertain about the consequences of our actions. Environmental management principles in the National Environment Management Act of 1998 (NEMA), which apply to all authorities whose decisions affect the environment and to private and public sector developers, enable the inclusion of biodiversity offsetting as a condition of authorisation. They include the 'polluter pays' principle, and the need to remedy adverse effects on biodiversity and ecosystems after avoidance and minimization. Both NEMA and the National Water Act 36 of 1998 (NWA) provide the competent authority with the discretion to impose any condition necessary for the protection of the environment/water resource, whilst the latter specifically authorises the lodging of financial guarantees for any required mitigation actions. The NEMA Environmental Impact Assessment (EIA) regulations list activities that are subject to environmental assessment. The significance of residual impacts triggers the need for offsets, which are required to address impacts on biodiversity predicted to be of 'medium' to 'high' significance. Impacts of 'very high' significance that may result in loss of irreplaceable biodiversity are considered unacceptable.

In terms of the National Environmental Management Biodiversity Act 10 of 2004 (Biodiversity Act), the State has trusteeship of the country's biodiversity and must 'manage, conserve and sustain' South Africa's

biodiversity and its components and genetic resources. The Biodiversity Act provides for the listing of threatened or protected species and ecosystems, and for the publishing of Bioregional Plans, thus identifying our priority biodiversity areas. In addition, this information signals the probable significance of impacts where the species or ecosystems are adversely affected by any proposed development.

The National Environmental Management Protected Areas Act 57 of 2003 (Protected Areas Act) provides for a range of options to protect an area, and point to the most secure statutory options to achieve this. Any of the four categories of protected area can be declared on privately owned land at the request, or with the consent, of the landowner(s). The Act provides for the involvement of parties other than organs of State in the declaration and management of protected areas as the primary tool to safeguard the nation's biodiversity assets, enabling offset management arrangements. Both the National Framework for Sustainable Development in South Africa (2008) and the National Strategy for Sustainable Development (2010) highlight the value of biodiversity to society, its importance in sustaining our life support systems and livelihoods, and the range of benefits to people of healthy, functioning ecosystems.

The National Biodiversity Framework (NBF, 2009) notes that biodiversity offsets are already being implemented to some extent in South Africa, but with little consistency. The Department of Agriculture, Forestry and Fisheries (DAFF, undated) has produced "Principles and Guidelines for control of development affecting natural forests" which includes biodiversity offsets and sets out the steps to be taken and aspects to be addressed. Both the Western Cape and KwaZulu-Natal have issued guidelines for Biodiversity Offsets, and other provinces are developing their own. Biodiversity Offsets are being called for by regulators in all provinces in South Africa.

National Offsets framework

A draft National Biodiversity Offsets Policy Framework has been developed by the Department of Environmental Affairs (DEA) (DEA 2017). This policy encompasses the following principles as a departure point for biodiversity offset development:

1. The Ecosystem Approach

The implementation of biodiversity offsets recognises the ecosystem approach (as opposed to a species approach) to biodiversity management, which promotes the integrated management of land, water and natural capital to affect the conservation and sustainable use of biodiversity, especially the need to safeguard and maintain critical biodiversity areas.

2. Offsets - the last resort in the Mitigation Sequence

Biodiversity offsets should only be considered as a mitigation option once all feasible actions and alternatives, first to avoid or prevent impacts on important biodiversity, then to minimize impacts, and then to repair or restore areas harmed by impacts to the condition before impact or better, have been considered.

3. Limits to what can or should be offset

Biodiversity offsets are to be used in cases where the EIA process identifies negative residual impacts of '**medium**' or '**high**' significance on biodiversity. Activities resulting in impacts of 'low' significance may not require an offset.

Impacts on biodiversity of 'very high' significance may not be able to be fully offset because of the conservation status, irreplaceability, or level of threat to affected biodiversity, or the risk of preventing scientific targets for conserving that biodiversity from being met. In these cases, given that the proposed activity would lead to irreversible impacts and irreplaceable loss of biodiversity, alternatives to the proposal should be sought; i.e. the proposed activity should not be authorized in its current form.

4. Ecosystem protection

Biodiversity offsets should ensure the long-term protection of priority ecosystem on the ground and improve their condition and function, thereby resulting in measurable positive outcomes for biodiversity conservation 'on the ground'. These outcomes could contribute to improved ecosystem integrity and increased use and/ or cultural value of offset areas and the ecosystems of which they are part.

5. No Net Loss up to specified limits of acceptable change

Offsets should not be used to 'soften' a development proposal that would result in unacceptable loss of biodiversity. Biodiversity offsets should be designed in such a way that scientific targets for conserving ecosystems and other biodiversity features in the long term are attainable and not undermined as a consequence of the proposed activity. No biodiversity feature (species or ecosystem) should be at risk of being pushed beyond an Endangered threat status by a development.

6. Locating biodiversity offsets in the landscape

Biodiversity offsets should be located in the landscape in such a way that they help to secure priority areas for conservation, improve connectivity between these priority areas, and/ or consolidate or expand existing protected areas. Where priority ecosystem services are residually affected, biodiversity offsets should preferably be located in the landscape in such a way that they deliver equivalent services to affected parties; that failing, additional compensation measures would be needed for these parties.

7. Equivalence – 'like for like'

Biodiversity offsets should comprise - or benefit - the same biodiversity components as those components that would be negatively affected by development. *In exceptional cases* only, and only with support from the provincial conservation agency, could consideration be given to the biodiversity offset targeting a relatively more threatened ecosystem or habitat.

8. Additionality – new action required

Biodiversity offsets must result in conservation gains above and beyond measures that are already required by law or would have occurred had the offset not taken place.

9. Timing and duration of biodiversity offsets

The design of the biodiversity offset and plans for its implementation should be approved by the provincial biodiversity conservation agency and the CEA before the proposed listed activity starts. Implementation of the biodiversity offset should preferably take place before the impacts of the activity occur, or as soon thereafter as reasonable and feasible.

The biodiversity offset site(s) should endure at least for the duration of the residual impact on biodiversity, but preferably in perpetuity, in order to make a long-term contribution to biodiversity conservation. It should be monitored and managed adaptively to sustain biodiversity outcomes.

10. Defensibility

The measure of residual negative impacts on biodiversity caused by a proposed development, as well as the design and implementation of biodiversity offsets, should be based on the best available biodiversity

information and sound science, and should incorporate local traditional or conventional knowledge as appropriate.

Offsets must consider all significant residual impacts on biodiversity: direct, indirect and/ or cumulative impacts. The scope of assessment must include due consideration of impacts on recognized priority areas for biodiversity conservation; impacts on biodiversity pattern (conservation status of ecosystem and species, importance to migratory species) and ecological and evolutionary processes (must look across scales and take into account connectivity, gradients and corridors); and impacts on ecosystems or species on which there is high dependence for health, livelihoods, and/ or wellbeing.

11. Precaution

The biodiversity offset must be designed in a risk-averse and cautious way to take into account uncertainties about the measure of residual negative impacts (including uncertainties about the effectiveness of planned measures to avoid/ prevent, minimize and rehabilitate impacts), and the successful outcome and/ or timing of the biodiversity offset.

12. Fairness and equity

The determination of residual negative impacts, and the design and implementation of biodiversity offsets, should be undertaken in an open and transparent manner, providing for stakeholder engagement, respecting recognised rights, and seeking positive outcomes for affected parties.

Biodiversity offsets should not displace negative impacts on biodiversity to other areas, and/ or cause significant negative effects that in turn would need to be remedied.

13. Non substitutable

A biodiversity offset cannot be exchanged for, or traded off against, compensation for social, cultural heritage or other residual impacts unrelated to biodiversity. Moreover, offsets for residual impacts on use or cultural values of biodiversity cannot be exchanged or substituted for offsets on intrinsic values of biodiversity.

14. Enforceable and auditable

Offsets must be able to be monitored and audited in relation to clear management and performance targets. In addition, they must be able to be enforced through explicitly worded, legally binding conditions, and/or common law contracts.

The desired outcome of biodiversity offsets is to ensure that the cumulative impact of development authorization and land use change does not:

- result in the loss of CBA's or jeopardize the ability to meet South Africa's targets for biodiversity conservation;
- lead to ecosystems becoming more threatened than 'Endangered'; and/or
- cause a decline in the conservation status of species and the presence of 'special habitats

1.4. THE NATURE OF COMPENSATION AND OFFSETS

1.4.1. THE FORM AND NATURE OF ACCEPTABLE BIODIVERSITY OFFSETS

It is useful to clarify the important conceptual differences between **trade-offs, compensation** and **offsets.** These mean different things and have rather different outcomes.

A measure must satisfy the principles above to call itself an 'offset'. In particular, an offset would not undermine conservation targets or lead to irreplaceable loss of biodiversity and would be commensurate with the residual impacts of the proposed activity.[1]

If a measure does not satisfy these principles, and instead offers some form of remedy that is not commensurate with, equivalent in type, or is insufficient to qualify as an offset (although it could contribute to meeting the target of the affected component biodiversity), then it would be termed 'compensation'.

A 'trade-off' is typically made between, rather than within, different categories or 'pillars' of capital (e.g. between socioeconomic benefits and biodiversity loss). A trade-off is not to be confused with 'trading-up' which can be accommodated in the offsets framework and allows impacts on one biodiversity feature to be offset by safeguarding another biodiversity feature of greater value and/or under greater threat.

Ultimately, even if an offset is deemed unacceptable due to, for example, the irreplaceability of the impacted biodiversity, ecological process or the ecosystem service being lost, this would not impede a regulator's ability to require compensation, or even to make a trade-off, provided that such compensation or trade-off is made within our legal framework and is defensible.

Biodiversity offsets can be achieved by:

- Increasing a target site's security against land use change, in the long term
- Restoring or repairing degraded areas
- Improved management, and/ or
- Preventing likely transformation or degradation of areas through formal/ legal protection. For protection and restoration to be effective in the offset context, they should endure in perpetuity, and be accompanied by significant land use and allied protection mechanisms to safeguard the biodiversity features for which they initially set aside. While it may be possible to achieve net gain in some critical habitat through successful restoration (of structure, function or condition), it is almost always preferable, in the South African context, to conserve a more pristine expression of the type, habitat of feature first.

1.4.2 OFFSET QUANTUM AND DESIGN

The quantum of biodiversity offsets in South Africa uses a basic ratio derived from a target which is in turn linked to the status[2] of residually affected ecosystems. Multipliers are often applied to this basic ratio where:

[1] In the international context of the IFC PS6 and the BBOP Standard (BBOP 2012b), an offset must achieve NNL or net gain; any measure that does not achieve that outcome would be termed 'compensation'

[2] The NEM: Biodiversity Act (Act 10 of 2004) provides for gazetting the threat status of different ecosystems. Notation used is the same as for Threatened species. Endangered = EN, Least Threatened = LT etc. The most recent list was published in 2013 (GN 3637516 APRIL 2013) amended 3 June 2020 GN 43386)

- the area comprises a component of a wider landscape recognized as having high conservation importance;
- the area supports several threatened species or species of special conservation significance;
- the area plays an important role at a landscape level with regard to ecological and/or evolutionary processes that, amongst others, help adapt to climate change;
- the natural systems of the affected area deliver ecosystem services on which there is a high dependency by local or downstream communities, or society as a whole;
- there is either a lack of confidence in impact predictions and/ or a risk of failure of proposed measures to avoid, minimize or rehabilitate/ restore negative impacts within stated time frames, implying that residual impacts would be greater (in extent and severity) than initially estimated; and/ or the delay between the impact and the return to pre-develpment condition is greater than 10 years, or a lifespan of a key component of the rehabilitation system, whichever is longer.

The design of the final offset area is dependent on several factors:

- The location and proximity of existing protected areas which may be expanded or consolidated
- The distribution of those biodiversity features and components of the offset across properties in the region
- The availability of specific properties on the market and/or the willingness of the owners to sell them or have them encumbered with offset restrictions
- Consideration of the objectives of the offset area, and its specific management requirements or efficiencies (e.g. having a sensible boundary to secure and avoiding disjointed management units that cross communication and transport lines)
- Capitalising on existing or proposed land use developments that could augment the offset and increase establishment success, and avoidance of current and future land use conflicts.

2. THE AFFECTED AREA

2.1. SIGNIFICANCE OF THE BIODIVERSITY IN THE AREA

The study area falls within the Bushmanland Bioregion of the Nama-Karoo Biome and on the edge of the Kalahari Duneveld Bioregion of the Savanna Biome (Mucina & Rutherford 2006). According to the vegetation classification of Mucina & Rutherford (2006, BGIS vegetation map updated 2018), there are two vegetation types present within the development footprint –Kalahari Karroid Shrubland and Gordonia Duneveld. The pipeline and water abstraction for Bokpoort I point runs through Bushmanland Arid Grassland and the Lower Gariep Alluvial vegetation types.

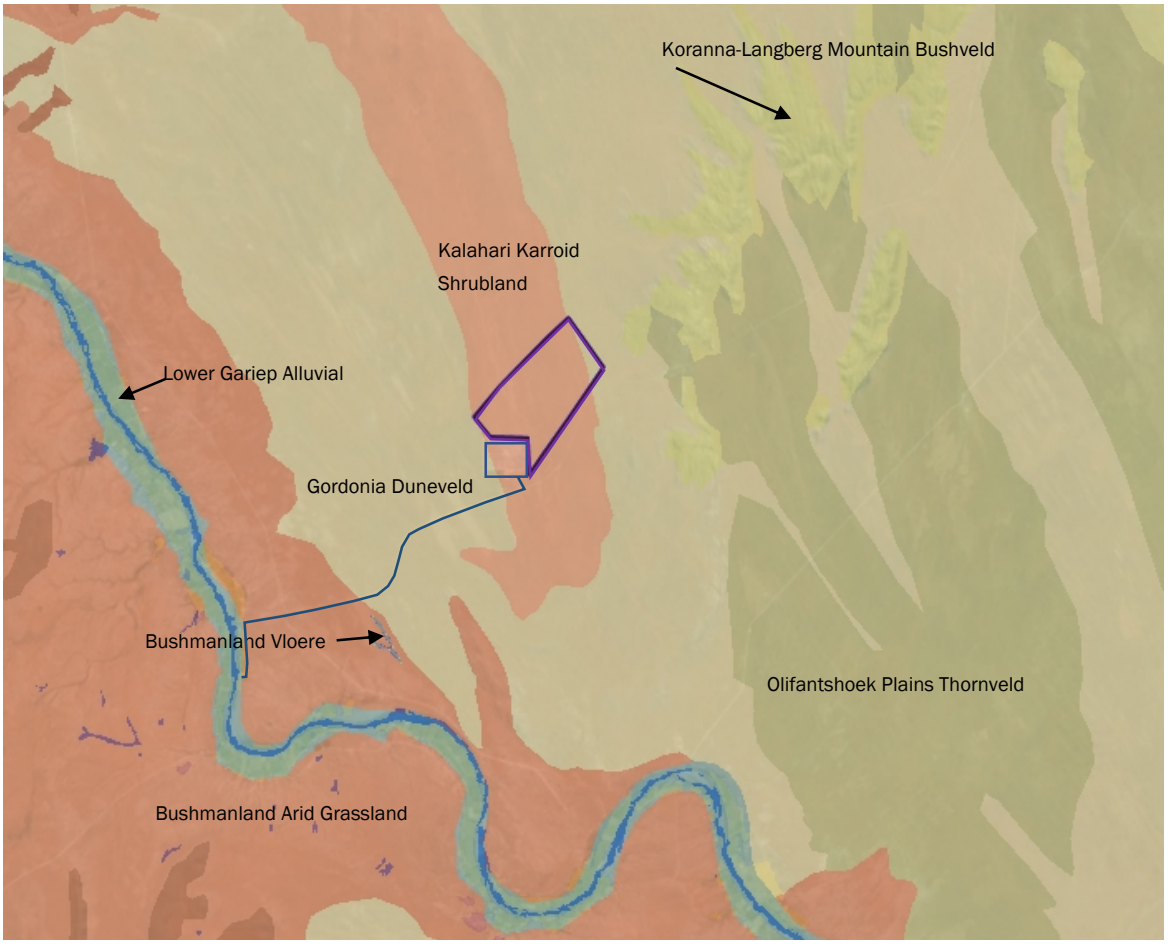

Figure 1 Vegetation distribution map of the area showing the proposed Bokpoort II development (Purple polygon) and the Bokpoort I development (blue polygon)

The botanical specialist survey and subsequent walk through surveys identified 8 floral species of conservation concern that occur on site. Most of these species are classified as LEAST CONCERNED, two are classified as DATA DEFICIENT. Three of the species are trees which are listed as protected under the National Forestry Act.

Species	Status	Permit applicable Legislation
Boscia albitrunca	LC Protected	National Forests Act 1998 NCNCA schedule 2
Vachellia erioloba	LC Protected	National Forests Act 1998
Vachellia haematoxylon	LC Protected	National Forests Act 1998
Aloe claviflora	LC Protected	NCNCA schedule 2
Acanthopsis hoffmannseggiana	DDT	NA
Euphorbia Davyi	LC Protected	NCNCA schedule 2
Hoodia gordonii	DDT Protected	NCNCA schedule 1 TOPS Protected schedule B1
Ruschia divaricata	LC Protected	NCNCA schedule 2

Table 1. Summary of the floral species of conservation concern (SCC) that occur on site

A number of specialist faunal studies have been conducted across the site, these have revealed a number of protected species confirmed on site, which are listed in the table below

Species	Common Name	Status	Permit applicable Legislation
Reptiles			
Pedioplanis lineoocellata	Spotted Sand Lizard	LC Protected	NCNCA Schedule 2
Psammobates oculifer	Serrated tent Tortoise	LC Protected	NCNCA Schedule 2
Pedioplanis inornata	Plain sand lizard	LC Protected	NCNCA Schedule 2
Varanus albigularis albigularis	Rock Monitor	LC Protected	NCNCA Schedule 2
Mammals			
Raphicerus campestris	Steenbok	LC Protected	NCNCA Schedule 2
Otocyon megalotis	Bat-eared Fox	LC Protected	NCNCA Schedule 1
Atilax paludinosus	Water Mongoose	LC Protected	NCNCA Schedule 2
Cynictis penicillata	Yellow Mongoose	LC Protected	NCNCA Schedule 2
Galerella sanguinea	Slender Mongoose	LC Protected	NCNCA Schedule 2
Hystrix africaeaustralis	Porcupine	LC Protected	NCNCA Schedule 2
Lepus capensis	Cape Hare	LC Protected	NCNCA Schedule 2
Lepus saxatilis	Scub Hare	LC Protected	NCNCA Schedule 2
Ictonyx striatus	Striped Polecat	LC Protected	NCNCA Schedule 1
Mellivora capensis	Honey Badger	LC Protected	NCNCA Schedule 1
Orycteropus afer	Aardvark	LC Protected	NCNCA Schedule 1
Aonyx capensis	Cape Clawless otter	Near threatened Protected	NCNCA Schedule 2

Table 2. Summary of the faunal species of conservation concern identified on site

No invertebrate SCC were recorded on site during these surveys, although two species *Alfredectes browni* (Browns Shieldback) and *Lepidochrysops penningtoni* (Pennington's Blue) are noted as possibly occurring in the area. Both these species are listed as Data Deficient. No Amphibian SCC were noted to occur in the study area. The *Agama atra* (Southern Rock Agama) was noted during the faunal surveys, this species is classified as Near endemic, although it is not listed as protected. The only avifaunal SCC recorded near the site was Verreaux's Eagle (*Aquila verreauxii*) which is listed as regionally Vulnerable. This species was recorded in the mountainous areas to the north of the site.

2.2. CONSERVATION VALUE OF AREA TO BE DISTURBED

In terms of the definition for critical habitats as described by IFC's Performance Standard 6 (PS6) on Biodiversity Conservation and Sustainable Management of Living Natural Resources. The Guidance Note 6, describes the criteria for critical habitat as follows;

i. habitat of significant importance to Critically Endangered and/or Endangered species;
ii. habitat of significant importance to endemic and/or restricted-range species;
iii. habitat supporting globally significant concentrations of migratory species and/or congregatory species;
iv. highly threatened and/or unique ecosystems; and/or
v. Key Evolutionary Processes

In terms of the site the following synthesis of site characteristics and the critical habitat criteria is provided below.

(i) Habitat of significant importance to Critically Endangered and/or Endangered species;

There are no Critically Endangered or Endangered, floral or faunal species located on or in the immediate vicinity of the site. Consequently, this criterion is not triggered for the site.

(ii) Habitat of significant importance to endemic and/or restricted-range species;

The study area falls within the Griqualand West Centre of Endemism (described in van Wyk & Smith 2001). Centres of endemism are extremely vulnerable; relatively small disturbances in a centre of endemism may easily pose a serious threat to its many range-restricted species (Van Wyk & Smith 2001). The Griqualand West Centre (GWC) is one of the 84 African centres of endemism and one of 14 centres in southern Africa, and these centres are of global conservation significance. The GWC is considered a priority area for conservation in the Northern Cape, as the number of threats to the area is increasing rapidly and it has been little researched and is poorly understood. Furthermore, this centre of endemism is extremely poorly conserved, and is a national conservation priority.

Although the site occur in a center of endemism, none of the SCC plant species that occur within the study site are endemic to South Africa, and only one of the plants, *Vachellia haematxylon* occurs only in the Northern Cape, the other species all occur in at least one other province. There are however two plant species that are categorized as data deficient which means there is insufficient information on the species at present to estimate population status but they are both considered to be widespread. No SCC reptiles or mammals that occur on site are endemic to South Africa, although the scrub hare is endemic to Southern Africa

As the *Vachellia haematoxylon* is mostly restricted to the dune veld and only a small area of dune veld will be impacted by the development, this criterion is not triggered for the site.

(iii) Habitat supporting globally significant concentrations of migratory species and/or congregatory species;

There are no migratory or congregatory species which are known to gather at the site. As such, the site is not considered important for any such species and this criterion is not triggered.

(iv) Highly threatened and/or unique ecosystems;

The National Biodiversity Assessment (NBA) is released every seven years and provides an assessment of South Africa's biodiversity and ecosystems. The current National Biodiversity Assessment (NBA) is the 2018 assessment. The NBA, includes headline indicators and national maps for the terrestrial, freshwater, estuarine and marine environments. The two headline indicators assessed in the NBA are ecosystem threat status and ecosystem protection level. Ecosystem threat status tells us about the degree to which ecosystems are still intact or alternatively losing vital aspects of their structure, function and composition, on which their ability to provide ecosystem services ultimately depends. Ecosystem types are categorised as critically endangered (CR), endangered (EN), vulnerable (VU) or least concerned (LC), based on the proportion of each ecosystem type that remains in good ecological condition relative to a series of thresholds. Ecosystem protection level tells us whether ecosystems are adequately protected or under-protected. Ecosystem types are categorised as not protected, poorly protected, moderately protected or well protected, based on the proportion of each ecosystem type that occurs within a protected area recognised in the Protected Areas Act.

Ecosystem status is based on the percentage of original area remaining untransformed (by croplands, mining, urban development & roads) in relation to the biodiversity target and a threshold for ecosystem functioning. Biodiversity target refers to the percentage of the original areas required to capture 75% of the species occurring in each vegetation type. The targets are aimed only at species conservation, and ecological processes are not considered. No significant disruption of ecosystem functioning is assumed in *least concerned* vegetation units, which still have more than 80% of their original extent untransformed.

The Kalahari Karroid Shrubland is listed as Least Concerned (NBA 2018). It is not well conserved, with only a small amount (0.1%) formally conserved within the Augrabies National Park. The total extent of this vegetation type is 8582,553 Sq Km, with 8291.594 Sq Km occurring within the ZF Mgcawu District Municipality of which 8,267.590 sq Km is considered to be in good condition (99% within the district). It is listed as a high conservation priority within the District Municipalities Environmental Management Framework (EMF), and its target is set at 21%.

The Gordonia duneveld is listed as Least Concerned (NBA 2018). It is considered to be moderately protected with 14.8% formally conserved, in the Kgalagadi Transfrontier Park. The total extent of this vegetation type is 37035,7065 Sq Km and 99.8% is considered to be in good condition, the target is set at 16%.

The Bushmanland Arid Grassland is listed as Least Concerned (NBA 2018) it is not well protected with 0.5% formally conserved within the Augrabies National Park. It is listed as a medium conservation priority within the District Municipalities Environmental Management Framework (EMF), and its target is set at 21%.

The Lower Gariep Alluvial is listed as Least Concerned (NBA 2018), however this vegetation type was listed as Endangered in the 2011 biodiversity assessment. There are ecosystem types which, based on the new land cover data, are in a lower threat category than the 2011 NEMBA assessment. In some cases this represents an improved understanding of the extent of natural habitat remaining, and in others it may be that the new land cover data is over estimating the extent of natural habitat, therefore it is recommended that these ecosystems are investigated further and supplementary assessments should be undertaken to substantiate the change in threat category. As an endangered ecosystem this vegetation unit qualifies as critical habitat under Criterion 4 highly threatened ecosystems. However, the abstraction point is located in an area that is already transformed by agricultural cultivation, and an existing abstraction point, and no longer supports natural vegetation; thus the area where the abstraction pipeline was placed is classified as modified habitat, and therefore cannot trigger this criterion.

The study area does not fall within a Freshwater Ecosystem Priority Area (FEPA) but it does fall within a fish support area. The study area does not overlap with any Important Bird Areas, or protected area.

Generally, the vegetation types present at the site are listed as least threatened. In addition, the site is homogeneous and there are no unique or rare habitats or ecosystems within or in close proximity to the site., this criterion is not triggered at the site.

(v) Areas associated with key evolutionary processes.

The area around the Bokpoort site is not classified as a CBA, indicating that it has not been identified as being important for the maintenance of landscape connectivity and ecological processes. However parts of the pipeline and the abstraction point does traverse a CBA, the presence of a CBA is considered to represent Critical Habitat for key Evolutionary Processes.

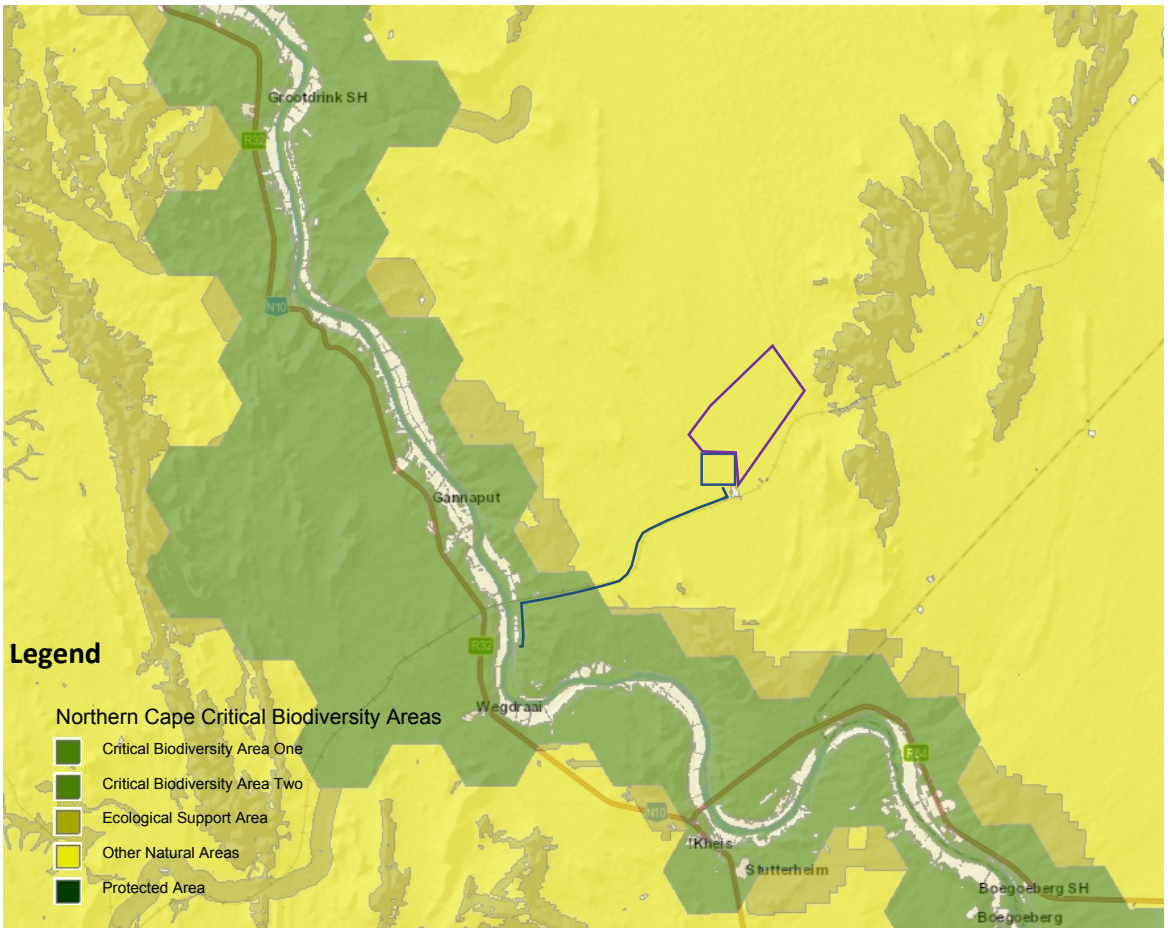

Figure 2 Critical Area Biodiversity map showing the proposed Bokpoort II development (Purple polygon) and the Bokpoort I development (blue polygon)

2.3. THREATS TO THE BIODIVERSITY ON SITE AND IN THE AREA

The Orange River provides water via an irrigation scheme that has resulted in much of the surrounding area of the river being developed and under irrigation. The greatest threat to the biodiversity in the area is the cultivation of land, which is mostly confined within the Lower Gariep Alluvial vegetation adjacent to the river. In addition to this, overgrazing, alien plant infestations, plant collecting for medicinal purposes and firewood contribute to the overall threat to biodiversity in the area.

Cultivation

Agriculture is a major economic activity along the lower reaches of the Orange River. At the moment it amounts to roughly 300 000 hectares of crops, grown west of the Vanderkloof dam. Livestock farming is generally practiced in the drier areas, with high-value crops such as grapes, pistachios, citrus, pecans and vegetables grown in a narrow riparian strip along the Orange River, supported by intensive irrigation supplied directly from the river.

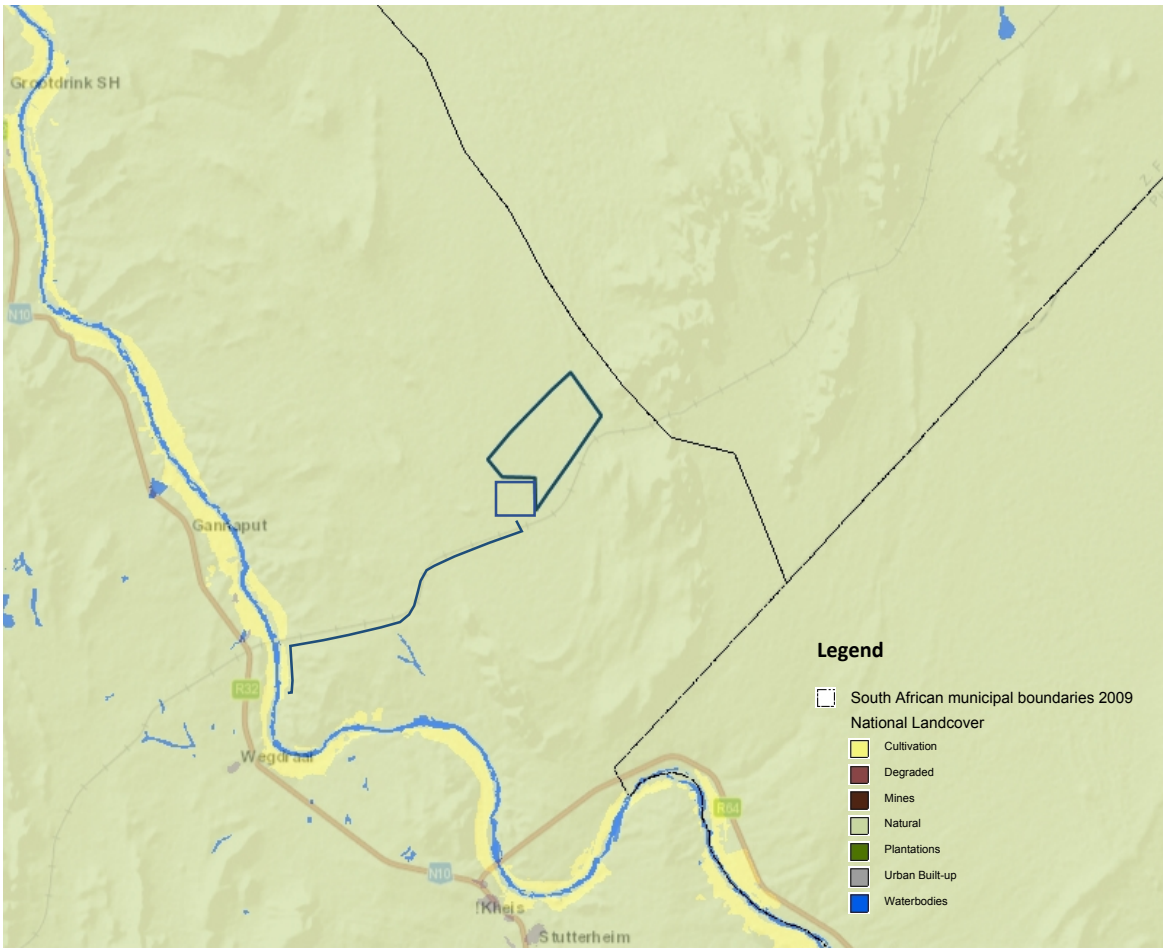

Figure 3 Landcover map of the area showing the proposed Bokpoort II development (Purple polygon) and the Bokpoort I development (blue polygon)

Overgrazing

Vegetation cover must be maintained to prevent soil and veld degradation. Carrying capacity indicates the number of hectares needed to sustain one Large Stock Unit without reducing the potential of the veld to carry livestock in future through degrading the vegetation condition. Overstocking results in vegetation species loss as well as a reduction in vegetation cover which in turn leads to soil erosion and sterilisation of soil resources.

Arid areas typically have sweet veld (veld that does not lose its palatability during the dry/winter season), sweet veld is more prone to overgrazing. The semi-arid to arid climate of the Northern Cape Province limits the vegetation cover and therefore the productivity of agriculture in the province. This lack of productivity results in farmers utilising marginal ground and stocking with higher animal numbers than what should be stocked in order to compete in the market. This pressure however has resulted in most agricultural ground in the Northern Cape being overgrazed. The degree of over utilisation does vary with plant communities and areas but it is a large threat to biodiversity. No detailed information is currently available on the extent of overgrazing and what areas are more overgrazed that others for the area surrounding the project site. However the property itself has in the past been extensively farmed, the large "monostands" of *Schmidtia*

kalahariensis across the site indicate over utilisation. The population of *Boscia albitrunca* further attest to heavy utilisation, as a large number of trees across the property show damage from over utilisation.

Alien infestations and bush encroachment

The project site and the area immediately surrounding the site do not have heavy infestations of AIS however they do occur witjin the greater area. These are at present mostly confined to areas that have been subjected to disturbance, such as mined areas and road reserves etc, but their presence is a threat to local biodiversity. Not only are alien species a threat to species diversity but the encroachment of indigenous species into an area, that causes a loss of species diversity and results in large patches of single species stands a threat to biodiversity.

Medicinal & firewood plant collections and illegal trade

Illegal harvesting of succulent plants to support the specialist horticultural trade and illegal collection of reptiles for the pet trade are taking place. However it still remains largely unknown to what extent the plants are being utilised within the area and on what scale illegal trade in faunal species is taking place although but does seem to be less than what occurs in the Namakwa District Animals such as vultures, monitor lizards, snakes and hedgehog are known to be used in traditional healing.

2.4. CURRENT & FUTURE PROTECTED AREAS

The formal protected areas include land-based and marine protected areas that are recognised in terms of the Protected Areas Act (Act 57 of 2003). In other words these formal protected areas are defined as areas of land or sea that are formally protected by law and managed mainly for biodiversity conservation.

Informal protected areas (eg conservancies) are areas of land not formally protected by law but informally protected by the current owners and users and managed at least partly for biodiversity conservation. It is important to differentiate protected areas from conservation areas, because there is no long-term security associated with conservation areas, they are not considered a strong form of protection.

Focus areas for land-based protected area expansion are large, intact and unfragmented areas of high importance for biodiversity representation and ecological persistence, suitable for the creation or expansion of large protected areas. The focus areas were identified through a systematic biodiversity planning process undertaken as part of the development of the National Protected Area Expansion Strategy 2010 (NPAES). They present the best opportunities for meeting the ecosystem-specific protected area targets set in the NPAES and were designed with strong emphasis on climate change resilience and requirements for freshwater ecosystems. The site is does not fall within a NPAES focus area and is not near any protected area.

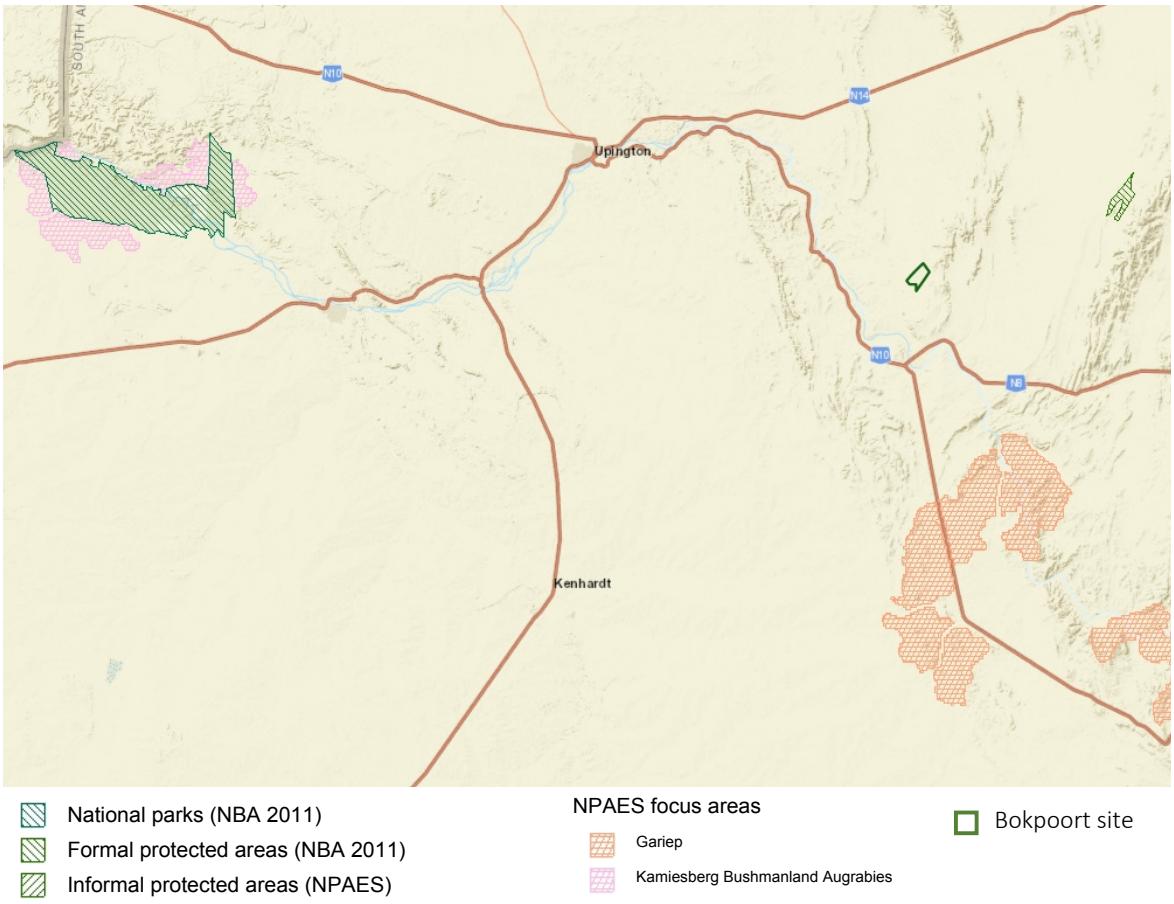

Figure 4 Protected areas and focus areas for land-based protected area expansion identified by the National Protected Area Expansion Strategy, in relation to the Bokpoort site

3. DETERMINING THE NEED FOR AN OFFSET

3.1. EVALUATE THE POTENTIAL FOR AN OFFSET.

In order to identify if there is a need for a biodiversity offset one needs to evaluate the occurrence of unavoidable and residual negative impacts of a proposed development, and whether an offset would in fact compensate for these impacts.

The actual need to offset the impacts of a development are only known once all the options and alternatives to avoid, minimize or repair/restore the impacts (the so-called 'mitigation hierarchy') have been evaluated during the EIA process. The common school of thought is that if these residual negative impacts on biodiversity have been found to be of 'medium' to 'high' significance then an offset is desirable.

The mitigation hierarchy is defined as:

1. **Avoidance**: measures taken to avoid creating impacts from the outset, such as careful spatial or temporal placement of elements of infrastructure, in order to completely avoid impacts on certain components of biodiversity.
2. **Minimisation:** measures taken to reduce the duration, intensity and / or extent of impacts (including direct, indirect and cumulative impacts, as appropriate) that cannot be completely avoided, as far as is practically feasible.
3. **Rehabilitation/restoration**: measures taken to rehabilitate degraded ecosystems or restore cleared ecosystems following exposure to impacts that cannot be completely avoided and/ or minimised.
4. **Offset:** measures taken to compensate for any residual significant, adverse impacts that cannot be avoided, minimised and / or rehabilitated or restored, in order to achieve no net loss or a net gain of biodiversity. Offsets can take the form of positive management interventions such as restoration of degraded habitat, arrested degradation or averted risk, protecting areas where there is imminent or projected loss of biodiversity.

The EIA process for this project states, that the photovoltaic plant development will potentially affect biodiversity in three main ways;

- Loss in extent of vegetation communities and loss & associated disturbance of species of conservation concern during construction;
- Effects on fauna species of conservation concern as a result of site lighting, security fencing and increased road traffic during operation, and
- The spread of invasive species and potential contamination of remaining natural (surrounding) ecosystems during closure.

3.1.1. EXHAUSTING THE MITIGATION HIERARCHY

AVOIDANCE

The proposed site is situated within one of South Africa's eight renewable energy development zones, and has therefore been identified as one of the most suitable areas in the country for renewable energy development. It is assumed that a suite of alternative options was explored in the original EIA process. These are not commented on here as it is deemed that the most feasible option was proposed.

MANAGEMENT AND MITIGATION

The various potential impacts to the biodiversity as set out in the EIA process were provided with numerous mitigation measures, and these are summarized below;

CONSTRUCTION PHASE

Mitigation Measure 1 - An Environmental Officer (EO) should be appointed prior to construction,

Mitigation Measure 2 - The following shall be instituted at the onset of the construction phase and shall be the responsibility of the EO, or delegated to an appropriate person:

- Development and implementation of a vegetation monitoring protocol, with appropriate
- Development and implementation of a faunal monitoring protocol,
- Development and implementation of an alien and invasive plant monitoring protocol,

Mitigation Measure 3 - Develop and implement an Alien and Invasive Plant Management Programme.

Mitigation Measure 4 - The Project shall ensure that permits for the removal, destruction and/or transplant of protected and conservation important plant species from the development site is valid for the time period of construction/ impact;

Mitigation Measure 5 - Execute the relocation of the *Hoodia gordonii* individual according to the recommendations to an area that is considered suitable in terms of habitat requirements, also ensuring that future disturbances/ developments will not result in additional impacts.

Mitigation Measure 6 - Prior to site clearance, conduct targeted searches for animal species of limited mobility within the development footprint (i.e. small mammals, burrowing species, etc.) that may have dens/resting places/ roosts, burrows, etc. within the footprint to allow natural movement from disturbance factors to take place where necessary, and avoid mortalities of these species;

Mitigation Measure 7 - Develop a conservation/ rehabilitation programme

Mitigation Measure 8 - Develop an effective waste management plan

Mitigation Measure 9 - Under no circumstances must any natural area on neighboring properties (outside the approved development footprint) be impacted, degraded, cleared, or affected in any manner. Demarcate the development footprint and relevant areas by semi-permanent means at the onset of site preparation to prevent accidental, or unwanted impacts in surrounding natural habitat and to control movement of personnel, vehicles, providing boundaries for construction and operational sites.

Mitigation Measure 10 - Areas proposed for vegetation clearance should be clearly marked and no heavy vehicles should travel beyond any of the marked works zone.

Mitigation Measure 11 - The retention of a vegetated buffer zone between the edge of the proposed infrastructure footprint and the outer boundary of the facility, within which the existing vegetation is retained, is recommended. This will reduce disturbance associated with the construction activities (presence of people and heavy machinery, disturbance of faunal species of conservation concern), and will also contribute to the conservation of natural vegetation adjacent to the project boundary.

Mitigation Measure 12 - No painting or marking of rocks or vegetation (in remaining or adjacent natural habitat) to identify locality or other information will be allowed, as it will disfigure the natural setting. Marking should be done by steel stakes with tags, if required. All temporary markings will be removed upon completion.

Mitigation Measure 13 - Prevent contamination of surrounding, natural habitat from any source of pollution, notably from hydrocarbon spillages, runoff, end-contamination from transformed areas, erosion, etc. Ducts that facilitate water flow underneath roads must be kept clear of litter, debris and must not be used to dispose of chemicals, unwanted effluent, etc. The waste management plan should take note of the storage and protection of the environment from hydrocarbon spillages.

Mitigation Measure 14 - No spoil material may be dumped outside the defined site.

OPERATIONAL PHASE

Mitigation Measure 15 - Continue the ecological (botanical, faunal and AIP) monitoring plans, at a frequency of at least annually for the duration of the Operational Phase of the operation. These monitoring programmes are considered separate from procedural and periodic environmental audits conducted by the EO.

Mitigation Measure 16 - Continue the Alien and Invasive Management Programme of declared and invasive plant species. The Environmental Manager should compile relevant action plans to deal with the presence of alien and invasive species.

Mitigation Measure 17 - Rehabilitation should be ongoing and should target areas where activities have been completed.

Mitigation Measure 18 - Site induction for contractors and personnel should include a familiarization with all aspects relating to environmental components of the project, notably the harvesting, collecting and removal of any plant and animal species, but also with specific reference to protected and conservation important taxa.

Mitigation Measure 19 - Prevent contamination of surrounding, natural habitat from any source of pollution, notably from hydrocarbon spillages, runoff end contamination from transformed areas. Ducts that facilitate water flow underneath roads must be kept clear of litter, debris and must not be used to dispose of chemicals, unwanted effluent, etc.

Mitigation Measure 20 - Movement control of vehicles across the site should be strictly controlled. No vehicles should be allowed outside the approved footprint areas. In particular, no vehicle movements should be allowed in natural habitat.

Mitigation Measure 21- Establishment of a fire management plan

Mitigation Measure 22 - A road management plan should be compiled prior to the commencement of construction activities to avoid exacerbated impacts on vegetation and minimize the exposure of natural habitat to disruptive activities.

Mitigation Measure 23 - Minimize the use of floodlight and high intensity lighting during the night. Where unavoidable, lights should be mounted as low as possible and fully shielded where possible. Beams should be directed only to areas where it is needed (avoid peripheral light), Use light bulbs that produces long wavelengths (ambers and reds) for all lights that are not under CAA regulatory specifications

Mitigation Measure 24 - Absolutely no animals may be hunted, trapped, snared, or killed for any purpose (apart from approved biodiversity management actions). Boundary fences should be patrolled regularly to check for and remove any snares or other animal traps;

Mitigation Measure 25 - Establish operational procedures for the safe capture and release of snakes from operational/construction areas, notably by a qualified specialist;

Mitigation Measure 26 - Develop a sighting and register log for observations pertaining to the presence/ abundance and occurrence of animals on site, killings along access roads, internal roads, etc;

The significance statement for the impacts on biodiversity for this project was based on the implementation of the above management and mitigation measures.

REHABILIATION/RESTORATION

Land rehabilitation as a part of environmental remediation is the process of returning the land in each area to some degree of its former state post development.

The aim of the rehabilitation plan is to:

- Return the disturbed area to an acceptable post development state;
- Ensure that all areas are stable, and there is no risk of erosion;
- Prevent alien plant invasion on the site until the site is in a stable state; and
- Ensure that all areas are free draining and non-polluting.

A plant species rehabilitation and re-vegetation plan has been compiled as part of the EMPr to establish a rehabilitation programme and plant species plan for the purpose of rehabilitating areas of temporary habitat loss as well as to establish ecological connectivity under the solar field.

This has been drawn up to manage the areas that will have a temporary loss of habitat and those areas that require restoration to ensure ecosystem function is re-established within the area.

RESIDUAL IMPACTS

Residual impacts are impacts that remain after mitigation and management measures have been implemented.

The actual need to offset the impacts of a development are only known once all the options and alternatives to avoid, minimize or repair/restore the impacts (the mitigation hierarchy) have been evaluated during the EIA process. It is only if there is an occurrence of unavoidable and residual impacts should an offset be considered.

Four of the impacts to the biodiversity listed in the EIA are assessed to show a moderated negative significance after mitigation, ie moderate residual impacts, these are

- Loss of habitats
- Loss/disturbance of flora and fauna species of conservation concern
- Direct loss (injury/mortality) of fauna species via roadkill
- Disturbance of faunal species of conservation concern – barrier to movement

The EIA however states that none of the anticipated impacts can be highlighted or construed to represent an unacceptable or severe threat to sensitive biological or biodiversity components within the study area and wider region. Ecological attributes and characteristics and biological components recorded on the site are regarded common and typical of the larger region and are not restricted to the site, i.e. no plant or animal species or habitat type will be affected in such a manner that the conservation status (local, regional, global) will be affected adversely. Although several species of conservation concern have been recorded within the study area, no species were recorded that would trigger 'Critical Habitat' as defined by IFC.

The EIA does nevertheless state that the high number of protected tree species recorded on the site would requires legislative authorisation prior to removal. During this permit application process for Bokpoort I the Department of Forestry stipulated as a condition of the Protected Tree Removal License, that ACWA Power Energy Africa (Pty) Ltd implement a Biodiversity Offset. This was deemed necessary owing to the high number of protected trees , most notably the *Boscia albitrunca* that would be removed from site as a result of the project.

3.1.2. CONSIDERING OFFSETS

The need for offsets does not depend on the scale or nature of the particular development, but on the significance of residual negative impacts on biodiversity and ecosystem services predicted as a result of that development. Biodiversity offsets should be considered to remedy residual negative impacts on biodiversity of 'medium' to 'high' significance.

The need for a biodiversity offset is determined by the significance of residual impacts as follows;

- Residual impacts of **'very high' significance** are a fatal flaw for development. Impacts would in all likelihood lead to irreplaceable loss of biodiversity, and/ or irreversible deterioration in valued ecosystem services, and therefore should not be authorised;
- Residual impacts of '**medium' to 'high' significance** should trigger a requirement for a biodiversity offset; and
- Residual biodiversity impacts of **'low' significance** would usually not require offsets, provided that all factors informing the evaluation of impact significance have been considered

Accordingly, as there are residual biodiversity impacts of 'medium' significance the project should trigger a biodiversity offset.

3.1.3. ADDITIONAL INFORMATION, ASSUMPTIONS, LIMITATION & UNCERTAINIES

It can be assumed that as there was a stipulation from the Department of Forestry to implement an offset for the removal of 975 trees (as per the license) for Bokpoort I, that the removal of additional trees as part of the Bokpoort II development , a similar condition as part of the protected tree removal application would be required.

With the expansion of the solar project, in terms of the development of Bokpoort II the offset needs to now cover the requirements for both Bokpoort I and Bokpoort II with respect to the loss of protected trees.

The term 'No Net Loss' (NNL) is defined as the outcome of an offset where there would be no loss of a vegetation type, habitat or feature beyond the scientifically established conservation target for that feature. For NNL, we assume that provision is made for a budget to ensure that the biodiversity values of that species, or habitat or feature, is maintained in the long term. However, in the absence of regional fine scale mapping, the determination of No Net Loss is not possible at fine scale vegetation community level or species level. No net loss of protected trees cannot be adequately tested as the extent of the resource is not known and has not been mapped or quantified.

3.2. QUANTIFYING THE OFFSET

At present there is a draft National Biodiversity Offsets Policy Framework that has been developed by the Department of Environmental Affairs which governs the methodology for quantifying offsets in South Africa.

The quantum of biodiversity offsets in South Africa uses a basic ratio derived from a target which is in turn linked to the status of residually affected ecosystems. Multipliers are then applied to this basic ratio dependent on the onsite conditions, the affected biodiversity and the risks associated with the project.

This is calculated using the criteria described in the table below (Table 3). Ecosystems or habitats are categorised according to their conservation status, which is in turn, assessed according to the degree of the transformation relative to the expected extent of each ecosystem or habitat. The status of a habitat or ecosystem is based on how much of its original area still remains intact relative to various thresholds.

Feature	Basic offset ratio[3]	Adjustments to size and/or number of offsets
Critically Endangered ecosystems, protected areas, Critical Biodiversity 1 (CBA1) areas identified in plans	30:1 ratio.	Negative impacts should be avoided as a priority and would be unacceptable unless exceptional circumstances can be

[3] **Note**: The above ratios do not apply to wetland offsets, where restoration of ecological function and services, as well as biodiversity, is the principal offset activity. For guidance on wetland offsets, reference must be made to wetland offset guidelines.

published or adopted by the relevant authorities.		demonstrated. Reference must be made to provincial guidance.
Endangered ecosystems, Critical Biodiversity 2 (CBA2) areas identified in plans published or adopted by the relevant authorities.	Minimum 5:1, up to 20:1.	Offset would need to be determined based on exact level of threat and taking into account levels of protection, ecological condition, presence of threatened species**, contribution to important ecological processes and ecosystem services. The minimum size of a viable offset should be determined by provincial guidance.
Vulnerable ecosystems, areas earmarked for Protected Area expansion, Ecological Support Areas (ESAs) identified in plans published or adopted by the relevant authorities.	Minimum 2:1, up to 5:1.	Offset would need to be determined based on exact level of threat and taking into account levels of protection, ecological condition, presence of threatened species**[4], contribution to important ecological processes and ecosystem services. The minimum size of a viable offset should be determined by provincial guidance.
Least threatened, Other Natural Areas (ONAs) identified in plans published or adopted by the relevant authorities.	Generally, no offset required.	Offset may be necessary to cater for residual negative impacts on rare habitats, threatened species**[2], on important ecological processes and ecosystem services. The appropriate size of a viable offset should be determined by provincial guidance.

Table 3. Criteria used to determine basic offset ratio based on ecosystem status.

In terms of the criteria in Table 3, the Bokpoort CSP field and PV project area does not contain any Critically Endangered, Endangered or Vulnerable Ecosystems. All habitat types within this area are listed as Least Threatened. For Least threatened ecosystem offsets are not generally required. The abstraction point and some of the pipeline area however traverses an area classified as a CBA, the presence of a Critical Biodiversity Areas does trigger a requirement for an offset. The basic offset ratio for a CBA 1 is set at a ratio of 30:1 and up to 20:1 for a CBA 2. Only 434m of the pipeline and abstraction point occurs within the CBA 1 and 5.49km traverses a CBA 2, and of this a very small amount of area will be disturbed and cleared. Owing to its proximity to agricultural development, a road and railway line very little primary vegetation will be lost in the CBA.

The walk-through survey and the permit applications confirmed the following protected species would be lost

Species	Bokpoort I		Bokpoort II	Total for permit applications
	Permit application	Removal register	Walk through survey	
Boscia albitrunca	975	478	4350	5325

4 **Note:** biodiversity offsets to accommodate threatened species or local endemic species with restricted distributions are not determined using offset ratios. Specialist advice on the particular affected species must be obtained, to inform an appropriate size and type of offset.

Vachelliai haematoxylon	135	107	653	788
Vachellia erioloba	45	31	394	439
Aloe claviflora	2290	183*	552	2842
Euphorbia sp	125	31*	5	130
Acanthopsis hoffmannseggiana	-	-	2607	-
Hoodia gordonii	-	-	4	4
Ruschia divaricata	-	-	252	252

*Plants were relocated not destroyed

Table 4. Protected plant species affected by the development.

Of particular concern is the substantial amount of *Boscia albitrunca* that will be lost as a result of this development. Offsets related to threatened species are usually not determined using an offset ratio but is guided by specific information on the species to inform an appropriate size and type of offset. However, very little research has been done on *Boscia albitrunca*, and thus questions remain on species occurrence (historical and current range), what its conservation status is and its population dynamics. Setting targets for species to determine an appropriate offset is not a simple task as it depends on many factors including the type of distribution data available as well as the taxa under consideration. Ideally species targets should be population level targets. In the absence of this information to set conservation targets for species, one can revert to the ecosystem data to facilitate setting these offset ratios. One would then need to consider the ecosystem targets for the Kalahari Karroid shrubland and the Gordonia Duneveld in which this species occurs in the study area to determine offset ratios.

The required percentage of remaining habitat needed to meet the target is set at 21% for the Kalahari Karroid Shrubland and 16% for Gordonia Duneveld. A revised conservation target for this exercise could include the initial national target plus a buffer to ensure that no species within the habitat becomes endangered. A Basic Offset Ratio can then be assigned by reading it off against its corresponding target on the "No-Net- Loss up to a Target" graph. For example an adjusted target set at 50% for the Kalahari Karroid Shrubland would result in basic offset ratio of 1:1.

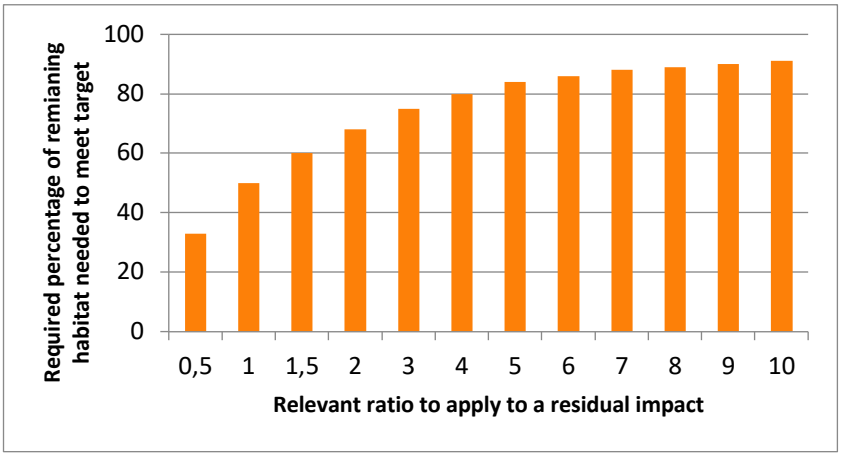

Figure 5 No Net Loss up to a Target graph for determining Basic Offset Ratio

Offset ratios are subject to other influences which act as additional multipliers to the basic offset ratio. These multiplier factors include;

Risks and uncertainties – the basic offset ratio can be multiplied to accommodate uncertainty regarding impacts, the multiplier is determined by the amount of risk or uncertainty of an impact occurring. For instance, in habitats where a complete loss of relevant species due to vegetation clearing (such as under the PV plants) will occur uncertainty is not relevant in these cases and an additional multiplier will not be required.

Condition of habitat – this multiplier caters for differences in condition of the habitat impacted. If the habitat within a development area is significantly better than in the surrounding area then an additional multiplier would be applicable. For this project the condition of the habitat within the development area is not better than the surrounding areas. The area surrounding the abstraction point and the pipeline has been disturbed and most of the natural vegetation has been removed. The abstraction point is within an existing agricultural development, the pipeline for the most part runs along a railway line and gravel road, thus is considered to be more disturbed than the surrounding area. The property where the CSP plant and PV plants will be located is comparable in condition to the surrounding area. There are signs of over utilization on the property but it is not significantly different to the habitat in the immediate surrounds, thus an additional multiplier for habitat condition is not applicable, for any of the ecosystem units affected by the development.

Biodiversity priority – This multiplier recognizes biodiversity priority. It may also be necessary to cater for special habitats, or areas that contain a large number of protected species. In areas where a significant amount of threatened and/or protected species occur and will be lost an additional multiplier is required to account for this loss. This multiplier is relevant within the project development area where large numbers of SCC, most notably *Boscia albitrunca* will be lost from the site

The multipliers can then be applied to the basic offset ratio to obtain a final offset ratio, which is then multiplied by the area of disturbance within each ecosystem, to give the required offset area for the project.

	Vegetation type	Conservation status	Conservation target NBA 2018	Critical Biodiversity Area	Residual loss (Ha)	Final Ratio	Offset required (Ha)
Bokpoort I	Kalahari Karroid Shrubland	Least Concerned	21%	NA	179,19803	2	358,39606
	Gordonia duneveld	Least Concerned	16%	NA	79,44154	1,5	119,16231
	Bushmanland arid grassland	Least Concerned	21%	CBA2	5,49305	20	109,861
	Lower Gariep Alluvial	LC/ Endangered	31%	CBA1	0,43401	30	13,0203
Bokpoort II	Kalahari Karroid Shrubland	Least Concerned	24%	NA	1243,12	2	2486,24
	Gordonia duneveld	Least Concerned	16%	NA	256,88	1,5	385,32
					1764,56663		**3471,99967**

Table 5. Offset summary table.

3.3. DESIGNING AN OFFSET

Offsets should be located in the landscape to :

- Be in the same bioregion, vegetation or ecosystem type and, preferably, the same quinary catchment as the impact site;

- Consolidate or buffer existing protected or priority conservation areas and/or minimize fragmentation of habitat;
- Make a maximum contribution to securing, protecting and/or linking biodiversity priority areas, and consolidating ecological corridors in the landscape identified in the provincial biodiversity plan, bioregional or other provincial or municipal biodiversity plans, SDF, EMF, fine scale plans, (etc.);
- Provide habitat for threatened species that would be adversely impacted; and
- Provide comparable ecosystem services specifically to those parties adversely affected by impacts on 'their' ecosystem services;

Internationally biodiversity offsets are currently used in reference to both like-for-like exchange for land, trading up to a higher conservation value habitat, and activities such as funding of biodiversity research, provision of financing for protected areas or support for capacity building in government agencies. In South Africa generally only land-based offsets are considered.

In order to establish what type of offset would be appropriate, a clear and valid purpose for the offset in broader conservation planning terms needs to be investigated. The offset must slot into existing provincial spatial conservation plans, and it needs to be established how the offset will contribute to this. Thus any proposed offset must align with existing development and conservation plans for the region in order for it to be successful.

3.3.1 REGIONAL INTEGRATED ENVIRONMENTAL MANAGEMENT PLANNING

The Management Framework for the District Municipality (EMF, EnviroNomics 2008) identifies Bushmanland Arid Grassland as being a medium conservation priority in the region, and Lower Gariep Alluvial Vegetation as being of high conservation priority. Conservation strategies for this region focused on the Lower Gariep Alluvial Vegetation of the Orange River (EnviroNomics 2008). No conservation areas for this vegetation type were proposed anywhere near Groblershoop. However the EMF also identifies environmental control zones, near the development site that includes

- Zone 2 – Potential wind erosion areas,
- Zone 3 – Potential high to very high vegetation conservation areas,
- Zone 6 Potential wind erosion areas in combination with potential high to very high vegetation conservation areas and
- Zone 7 Low control zone.

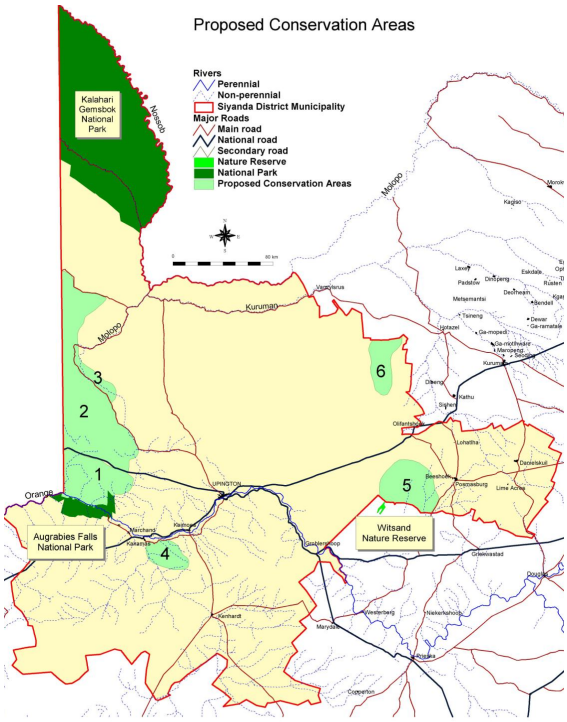

Figure 6 Proposed conservation areas identified in the EMF for the District Municipality in which the powerline falls.

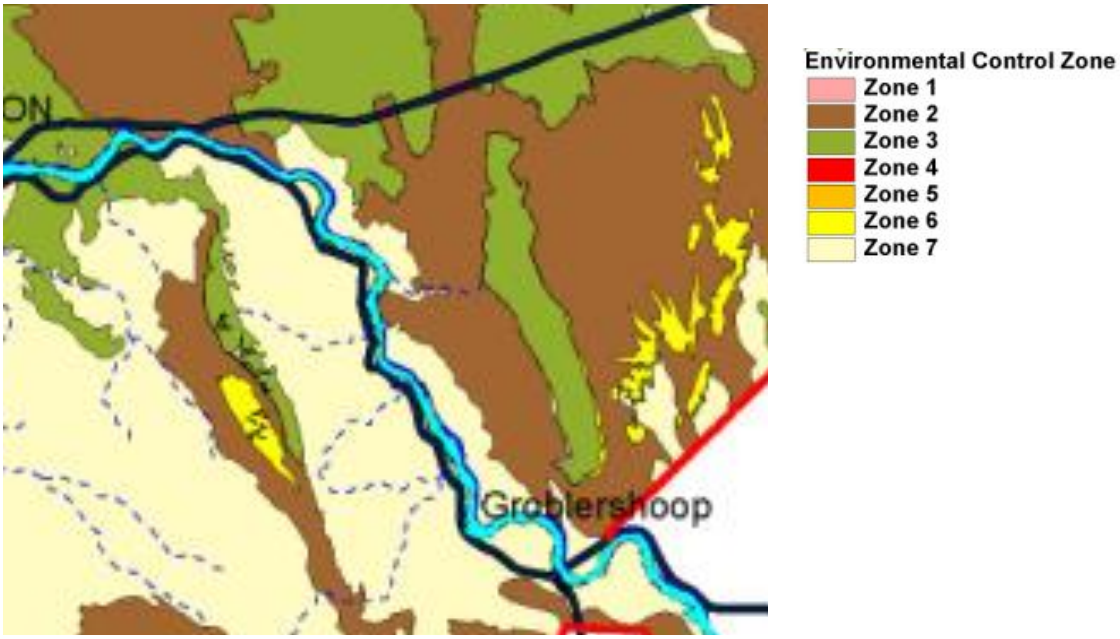

Figure 7 Environmental Control Zones identified in the EMF for the District Municipality

The Formal Protected areas that occur within the District Municipality include the Kgalagadi Transfrontier Park and Augrabies National Park. The NPAES have identified a focus area for protected area expansion within the region (see Figure 4).

3.3.2 OFFSET OPTIONS

LIKE FOR LIKE OFFSET

Biodiversity offset policies around the world are often based on the principle of 'LIKE-FOR-LIKE or better'. The outcome is to offset the biodiversity components to be impacted by targeting the same biodiversity components elsewhere (an 'in-kind' offset).

It is assumed that the area adjacent to the solar development contains that same local scale plant communities and habitat that will lost through the process of clearing of vegetation. Thus conserving an area around the development will ensure that the specific loss to biodiversity through vegetation clearing will be offset, as the exact same communities and habitats will be conserved rather than conserving areas removed from the impact site that may be slightly different.

A total offset area of 3471 Ha is not significantly large for this area, however this size offset area given the average density of trees for the area would secure approximately 10 000 trees provided the vegetation communities were comparable to the development area.

There are no existing formal conservation areas in the immediate vicinity into which the biodiversity offset could feed. The EMF has however identified a zone 3 Area (Potential high to very high vegetation conservation areas) indicating there may be some potential to develop a conservation zone in this area. There are also private reserve areas within the vicinity, such as Kalahari oryx, Glen Lyon and Thuru Lodge that may provide options into which the offset could feed.

An additional option would be the procurement of land within the focus area for the land-based protected area expansion. A focus area has been identified in the region. This area has already been ear-marked as an area in which to expand the protected areas network for the region, however as it is removed from the development site it may not include all the plant communities and/or species of special concern. The presence of all required vegetation units such as the Kalahari Karroid Shrubland wold have to be investigated. This option would require assistance and guidance from the DENC to ensure it will form part of a greater conservation initiative, as small isolated pockets of conserved land have little holistic conservation value and are not sustainable in perpetuity.

TRADING UP –OFF SITE OFFSET

This would entail conserving land considered to have a higher conservation value than the vegetation within the proposed development area, i.e. conserving the vegetation in another area that has been less disturbed and degraded. Trading up by conserving vegetation in better condition elsewhere, if possible, would compensate for biodiversity loss. It is also best if the offset is a part of an existing conservation area or earmarked for declaration as a protected area.

Existing conservation areas include the Augrabies National Park, the Kgalagadi Transfrontier Park and Witsand Nature Reserve . Options for these areas would include buying land to expand their conservation

areas, if required. However the exact plant communities that will be affected by this development may not be offset by this option as these areas are somewhat removed from the project site. There is some uncertainty in the literature whether protecting land that is similar to the land being developed is as ecologically meaningful as creating offsets on the actual site being developed. However if it can be established that a significant amount of protected trees would be conserved by this option it would provide a sufficient argument to pursue this option.

4. CONCLUSION & WAYFORWARD

The scope of this report is not to present a suitable offset but to investigate the need for an offset and conceptualize that offset requirement.

The investigation has established that there is a need for an offset given the scope of residual impacts, particularly with respect to the impacts on the *Boscia albitrunca* trees. According to the SCC plant removal register 478 *Boscia albitrunca* have already been removed for the Bokpoort I development and it is possible that an additional 4350 *Boscia albitrunca* will be lost during the construction of Bopoort II, thus almost 5000 trees could be impacted by the development

Offsets related to a particular species are generally not determined using an offset ratio. Information on the affected species is used, to inform an appropriate size and type of offset. However, in the absence of available data on conservation targets for the species the ecosystem data can be used to determine offset ratios. Using this approach an offset area of 3471Ha (600Ha for Bokpoort I and 2871 for Bokpoort II) was calculated for this development.

All offset options must include both Bokpoort I and Bokpoort II, in terms of offset obligations. Once consensus has been reached by the various stakeholders in terms of determining offset size and appropriated offset (ie Like-for-like offset), the next step in the offset process will be the identification of a suitable offset site. Once this has been achieved a management and implementation plan can be produced for the offset.

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