



Biodiversity Assessment

for the

determination of the presence of
protected species

Remaining extent of Farm Onder
Rugzeer, Kenhardt, Northern Cape

Kenhardt PV3

Compiled by: L P Maingard BSc Hon
(Cand.Sci.Nat)

Reviewed by: S C Bundy MSc (Pr.Sci.Nat)

Compiled on behalf of: Scatec Solar

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Kenhardt PV3

Photo voltaic Facility to be established on
Remaining extent of Farm Onder Rugzeer, Kenhardt, Northern Cape,

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Client	Scatec Solar
Compiled by	L P Maingard BSc (Hons)
Company	SDP Ecological and Environmental Services
Contact details	P O Box 1016, Ballito, 4420
Telephone	082 446 4847
E mail	luke@ecocoast.co.za
Reviewed by	Simon C Bundy (BSc MSc) Pr Sci Nat

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Acronyms

NCDEAC – Northern Cape Department of Environmental Affairs and Conservation

NEMA – National Environmental Management Act

DWS – Department of Water and Sanitation

NWA – National Water Act

NFEPA – National Fresh Water Ecological Priority Areas

PES – Present Ecological Estate

EI – Ecological Importance

SANBI – South Africa National Biodiversity Institute.

EXECUTIVE SUMMARY

A biodiversity assessment of the approved Kenhardt Photo Voltaic 3 site was undertaken in November 2020. The assessment was carried out through a grid-based reconnaissance of the site with occasional crepuscular and nocturnal assessment periods.

The object of the assessment was:

1. To identify any protected botanical specimens within the site.
2. To identify any faunal communities or individuals that may require relocation or may be considered to be directly affected by the establishment and operations of the PV facility.
3. Record the presence of such specimens to assist with final planning and design as well as conform with applications for licenses and permits to remove or disturb such specimens.

Additional site walk overs had been carried out since the initial investigation in 2020. A review of Kenhardt PV 3 has indicated that this site does contain a single specimen of *Aloidendron dichotomum* as well as populations of *Dintheratus pole-evansii* and *Avonia ablissima*. Two management options are evidently available:

1. Removal and transfer of the specimens.
2. Avoidance of the specimens through incorporation within the layout plan.

In practice, a combination of the above management options would be required. Any disturbance, removal or transfer of these specimens would require the applicable permit prior to undertaking any such activity.

The presence of listed and protected fauna on the site is unlikely and where encountered, species are generally transient across site or in the case of some invertebrates, may be using the site for the establishment of burrow refugia.

1. INTRODUCTION.

Scatec Solar SA 370 (Pty) Ltd is the authorisation holder (EA 14/12/16/3/3/2/836) in respect of the Kenhardt PV 3 facility that which permits the establishment and operation of a 100 MW solar photovoltaic facility. The PV3 facility is located east of Kenhardt (Figure 1) and has been subject to ecological evaluation during the environmental impact assessment process. Kenhardt PV 3 is one of 6 approved solar facilities.

The Environmental Authorisation and associated legislation require that prior to construction of the facility, an evaluation of the ecological or biodiversity components of the site be undertaken. The objective of this evaluation is to identify plant specimens, in particular that may be of ecological significance, or are listed within the applicable Provincial and National legislation. Such evaluation is, where applicable, to accompany an application to the appropriate Department for the issuance of a license to disturb or remove identified specimens.

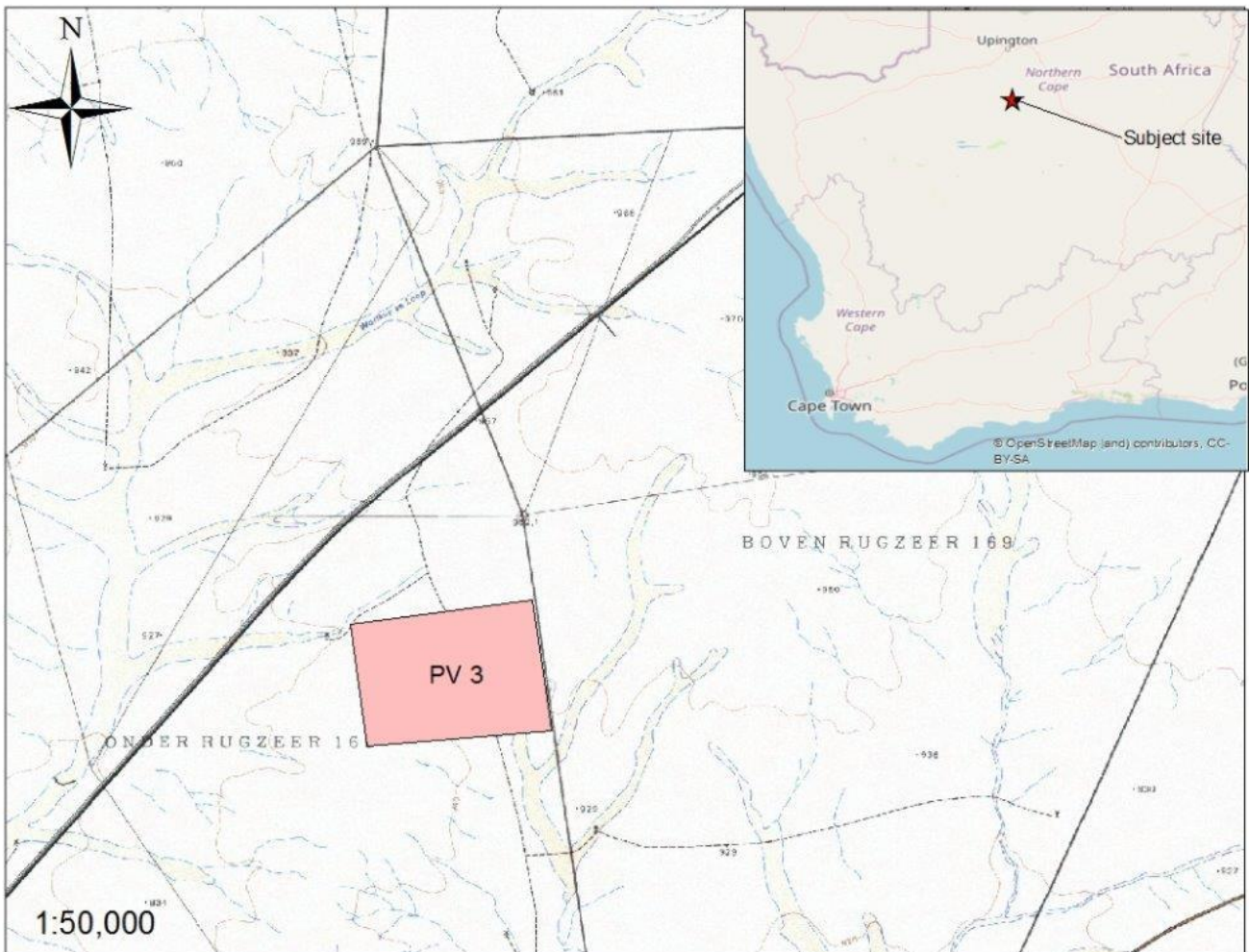


Figure 1. Regional map image of the subject area.

This report was compiled to inform the authorisation holder and their professional team of the presence of botanical specimens of value or protected in terms of relevant legislation, as well as to inform on the likelihood of faunal species that may be present within the site. Management recommendations on the above are also presented.

In addition, this report is to be submitted as supporting information in respect of any application for a license to “cut, move or destroy” a listed botanical specimen, or to relocate or transport fauna that has been declared “threatened or protected”.

2. LEGISLATION.

EA (14/12/16/3/3/2/836) was issued to Scatec Solar 370 Pty Ltd, following review by the mandated authority of both specific and requisite investigations relating to the development of Kenhardt PV 3. Compliance with other legislation is however, required in respect of both the EA and the overarching legislation. In respect of ecological aspects, the following legislation is to be adhered to with regards to the presence of selected floral and faunal species that may be encountered on Kenhardt PV 3:

1. The National Environmental Management: Biodiversity Act (Act 10 of 2004)

This Act serves to control the disturbance of land and its utilisation within certain habitats, as well as the planting and control of certain exotic species. The proposed development, taking place in the identified Bushmanland Arid Grassland environment, may not necessitate any particular application for a change in land use from an ecological perspective, however the effective disturbance and removal of species identified below, as well as possibly other species (i.e. TOPS species), will require specific permission from the applicable authorities.

In addition, the planting and management of exotic plant species on site, if and where required, will be governed by the Alien and Invasive Species (AIS) regulations, which were gazetted in 2014. These regulations compel landowners to manage exotic weeds on land under their jurisdiction and control.

2. The National Forest Act (Act 84 of 1998)

The National Forest Act (Act 84 of 1998) governs the removal, disturbance, cutting or damage and destruction of identified “protected trees”. The focus of this assessment has been to identify the position and nature of these specimens within the site. Where their removal is required, or where disturbance of the specimens will arise, a license must be obtained from the mandated authority, in this case the Department of Environment, Forestry and Fisheries, in terms of Section 15 of the Act. A specimen sample of the license application form is attached.

The same Act also considers the clearance of “forest” as requiring a license from the authority. In this regard the legal definition of a “forest”, is the presence of three or more trees with contiguous or interfacing canopy cover. While not a scientific definition, no forest form has been identified on the subject site and such habitat is generally not applicable to an arid grassland environment. It is therefore unlikely that an application for the “clearing of a *natural forest*”, as defined within the Act, will be applicable to the site in question.

3. The Northern Cape Conservation Act (Act 9 of 2009)

The Northern Cape Conservation Act under its pertinent regulations and schedules governs the disturbance, transport and movement of faunal and floral species. A permit from the Northern Cape Department of Environment and Nature Conservation will be required in order to disturb or translocate both floral and faunal species, that are listed in terms of the Act, while the same Act presents controls and regulations on the planting of certain listed species which may be considered to be “exotic”.

It is clear that where listed species are encountered on site, an application for licenses may be required in terms of both Provincial and National legislation.

3. METHODOLOGY & APPROACH.

Primary site reconnaissance at Kenhardt was undertaken between 23 November and 28 November 2020 by SDP Ecological and Environmental Services whereby the following actions had been carried out:

- Evaluation of historical information and data was undertaken, with consideration of findings.
- Evaluation of mapping and spatial information in finer scale in order to identify anomalies and related features within the site.
- Traverse of the subject area using a grid pattern of evaluation was undertaken. Specific consideration was given to geomorphological features and the interface between such features.
- All vegetation associates were reviewed for the presence of cryptic and smaller succulent specimens.
- Larger listed botanical specimens, where identified were logged using a Garmin GPS. Where required, photographic evidence of the specimen was obtained.
- Larger woody specimens were inspected for the presence of any fauna that may be associated with the specimen, in particular nests, burrows and related faunal refugia. Where encountered, these were logged
- A camera trap was established for 24 hours on 26 November 2020.
- Night reconnaissance was undertaken on 27 November 2020 to consider the presence of nocturnal faunal species.
- All fauna identified within the site were identified to lowest taxa and recorded.
- All collated data was downloaded and placed into ARC GIS.
- Report compilation was undertaken.

3.1 Assumptions and Limitations

Reconnaissance of the site was undertaken during the mid-summer of November 2020. This period is notably extremely dry, with summer rains in the region being evident in and around March of each year, which is accompanied by resurgent growth in floral communities. Under excessively dry periods, vegetative growth and flowering may be delayed, often affecting the ability to detect smaller specimens, such as *Lithops spp* and other cryptic species or geophytes. It therefore follows that while care has been taken to evaluate all portions of the site, as well as particular niche environments, it is evident that not all specimens may have been located or logged. In acknowledgement of this limitation – it is recommended that a final inspection be carried out by the appointed ECO of this project.

Additional walk through(s)

Seasonal limitations during the initial site visit in 2020, with recent precipitation events experienced in Kenhardt over the months of February and March 2021 as well as comments received by DFFE and DAERDLR on the 26 of April 2021 had prompted the following additional walk throughs in order to log any individual species that had been previously unrecorded:

- Site walk over in accompaniment of DFFE and DENC on the 29th of March 2021.
- Site walk over by Scatec Solar and Cape EAP on the 30th of April 2021.

Statistical application

Sample standard deviation was calculated based on the number of species individuals *in toto* recorded throughout Farm Onder Rugzeer, Kenhardt, Northern Cape, to allow for statistical determination of dispersion within each PV site. The complete tally of individuals included the addition of standard deviation for the purposes of accurate permit application submissions, to the satisfaction of DFFE and DAERDLR in ensuring that ‘sufficient quantities are applied for removal’. These workings are attached as annexure B for view.

4 OVERVIEW OF SITE

The climate of Kenhardt and surrounds is classified “BWh”, using the Koppen-Geiger climate classification method (www.koeppen-geiger.vu-wien.ac.at) which is indicative of an arid hot environment. As such, the area can be considered to be arid, verging on hyper arid (www.wad.jrc.ec.europa.eu) with an annual rainfall of less than 200 mm per annum (SA Weather Services, 2015). As such, the area in question is undergoing protracted and extensive drought, with concomitant changes in the physical and biotic state of the land. It follows that the regional vegetation type, namely Bushmanland Arid Grassland (NKB 4) has been subject to extreme water related stresses. As such the following, generally indicative of the veld type can be determined to have been affected by such conditions:

- Low graminoid or grass cover is evident across much of the area. The typical grass of the region, namely *Stipagrostis schmidtia*, has been subject to extensive grazing and senescence and is only evident in small associations or scattered specimens.
- Senescence of a number of woody specimens is evident, in particular emergent *Boscia sp.* These species are generally tolerant of aridity, however extreme aridity has resulted in specimens becoming moribund or senescent.

Kenhardt PV 3 lies further to the south of the Sishen – Saldanha Railway line. The topography can generally be described as “flat” with little topographic variation. Soils are primarily fine aeolian sands derived from the prevailing Kalahari Group geology. As indicated, limited topographic variation is evident, however calcrete exposures are present at points. An individual *Aloidendron dichotomum* as well as *Dinteranthus pole-evansii* populations as well as *A albissima* populations, (Figures 2, 3 and 4) are present on site, and these positions are presented in Table 1. As indicated in the images, much of the area is devoid of vegetation with *Rhigozum trichomotum* dominating at points.

Table 1. Listed botanical species within Kenhardt PV 3 that require permit(s).

Species	Listed under	Co-ordinates
<i>Aloidendron dichotomum</i>	Northern Cape Conservation Act	29°12'43.37"S 21°18'48.99"E
<i>Dinteranthus pole-evansii pop.</i>	Northern Cape Conservation Act/ UN red list	29°12'18.66"S 21°18'22.55"E
<i>A albissima pop</i>	Northern Cape Conservation Act	29°12'44.60"S 21°18'13.60"E

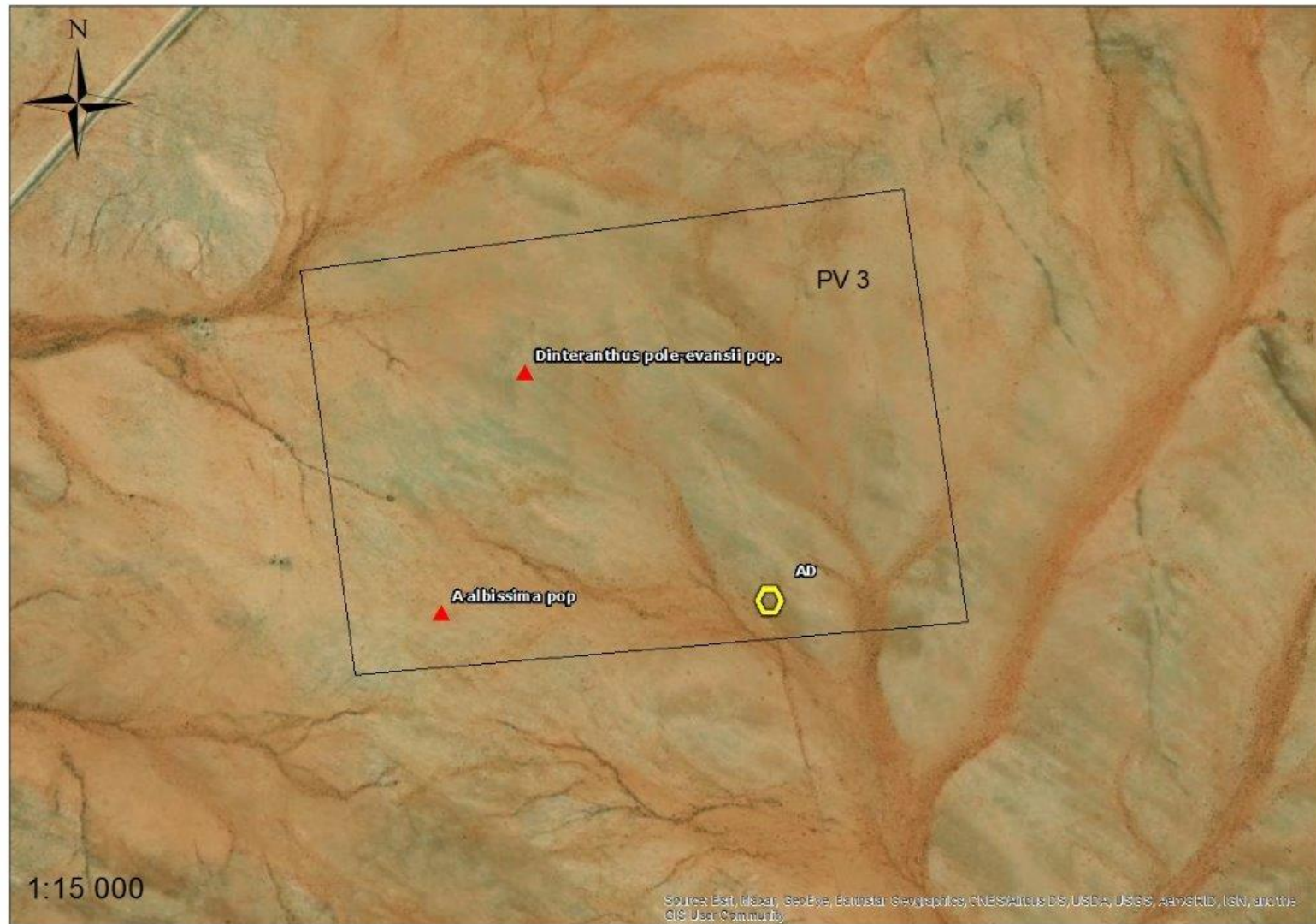


Figure 2. Map image detailing the position of identified botanical specimens within PV 3.



Figure 3. Image of *Dinteranthus pole-evansii* (Left). Image of *Aloidendron dichotomum* (right).



Figure 4. Image indicating presence of *A. albissima* within the PV 3 site.

4.1. Fauna

Table 1, below presents the updated faunal species list for the subject area, as compiled by these authors and based on observation, spoor, spat and in some cases, anecdotal information.

From Table 1, five species that are listed as “Threatened or Protected Species”, in terms of the NEM Biodiversity Act have a high likelihood of occurrence in the locality. Of these, three are invertebrates (two Scorpiones). The scorpions are likely to be present on the subject site, given the sandy nature of the site and the suitable opportunity for the establishment of refugia.

Table 2. List of Terrestrial Species identified within and around

		Observations	NC conservation Act	TOPS (2007)	Cons. Importance (IUCN)
Mammals					
<i>Orycteropus afer</i>	Aardvark	Foraging evidence		Protected	LC
<i>Felis nigripes</i>	Black-footed cat	Observed – roadkill	Protected		VU
<i>Atelerix frontalis</i>	South African hedgehog	Per communication		Protected	LC
<i>Canis mesomelas</i>	Black back jackal				Not listed
<i>Xerus inauris</i>	Cape ground squirrel	Observed	Protected		Not listed
<i>Lepus capensis</i>	Cape hare	Observed			Not listed
<i>Felis caracal</i>	Caracal	Remains of prey	Protected		Not listed
<i>Procavia capensis</i>	Rock dassie	Observed			LC
<i>Suricata suricatta</i>	Meerkat	Observed	Protected		LC
<i>Aethomys namaquensis</i>	Namaqua rock mouse		Protected		Not listed
<i>Hystrix africaeaustralis</i>	Porcupine	Observed	Protected		LC
<i>Antidorcas marsupalis</i>	Springbok	Observed	Protected		LC
<i>Raphicerus campestris</i>	Steenbok	Observed	Protected		LC
<i>Cynictis penicillata</i>	Yellow mongoose	Observed	Protected		LC
Reptiles					
<i>Ptenopus spp</i>	Barking gecko				LC
<i>Naja nivea</i>	Cape cobra				Not listed
<i>Chondrodactylus angulifer</i>	Giant ground gecko				LC
<i>C bibronii</i>	Bibrons gecko	Observed			LC
<i>Cordylus spp</i>	Girdled lizard		Protected	Protected	<i>C cataphractus</i> ; - EN
<i>Psammobates tentorius</i>	Karoo tent tortoise				Not listed
<i>Geochelone pardalis</i>	Leopard tortoise	Observed			Not listed
<i>Bitis arietans</i>	Puff adder				Not listed
<i>Nucras ornata</i>	Ornate sand lizard	Observed			Not listed
<i>Agama makarikarica</i>	Spiny agama	Observed			Not listed
Amphibians					

		Observations	NC conservation Act	TOPS (2007)	Cons. Importance (IUCN)
<i>Tomopterna cryptotis</i>	Tremolo sand frog				LC
Invertebrates					
<i>Locustana pardalina</i>	Brown locust	Observed			Not listed
<i>Pterinochilus spp</i>	Baboon spider			Protected	Not listed
<i>Seothyra spp</i>	Buckspoor spider				Not listed
Family Vespidae	Various wasps	Observed			
Opisthophthalmus spp	Burrowing scorpions?	Burrow entrance	Protected	Protected	Not listed
<i>Parabuthus spp</i>	Parabuthid scorpion			Protected	Not listed
Hodotermitidae	Termite				Not listed

TOPS – Threatened or Protected Species GN R151 of the National Environmental Management: Biodiversity Act (Act 10 of 2004) ; IUCN – International Union of Conservation Networks :*. LC = Least concern; NT = Near threatened; VU = Vulnerable; EN = Endangered CR = Critically Endangered; EW = Extinct in the wild; NE = not evaluated; DD = data deficient

A frontalis, is possibly less likely to be present on site, given the low grass cover, although transient movement, usually nocturnal, into the site is possible. Sungazers (*Cordylus spp*) may however be encountered in the area, as they, like the parabuthids, excavate their burrows.

Those specimens most likely to be affected by the establishment of PV 3 on the subject site are:

- Nocturnal species, such as *A frontalis*, who may succumb to the passage of motor vehicles at night.
- Fossorial species, such as Parabuthids, that may be affected by excavation.

Management actions to reduce species mortality are embedded in the Environmental Management Programme compiled for the project, however, such measures should include:

- Fencing of the site for construction purposes
- Frequent inspection of transformer sumps and fuel bunds.
- Daily inspection of excavated areas.
- The flushing of wildlife from the fenced area, to ensure that no larger specimens are present within the site.
- Walkover to consider the presence of burrows and other signs of small vertebrates and invertebrates being present within the site.

In most cases, it is likely that animal specimens will leave the site as a consequence of disturbance at the commencement of construction. However, some species, such as *Orycteropus afer* are likely to move freely into and out of the construction site, despite fencing and other exclusionary measures. Where this becomes a problem or a risk to the animal, capture and relocation can be considered. Such measures are often not successful and require permitting by authorities. Trained personnel should be engaged where capture and relocation is required.

5 CONCLUSION

Review of Kenhardt PV 3 has indicated that this site presents an individual *Aloidendron dichotomum* along with populations of *Dinteranthus pole-evansii* populations as well as *A albissima* populations. These specimens are isolated in nature and not contiguous. Two management options are evidently available:

1. **Removal of the specimens.** Notably *A dichotomum* can be translocated to a different environment with some ease, dependent upon size.
2. **Avoidance of the specimens.** Good practise would be to incorporate these specimens into the overall layout of the facility. Following the mitigation hierarchy, good practise would be to incorporate these specimens into the overall layout of the facility and avoid disturbance. However, if avoidance is not possible, pruning and complete removal of the specimen should be carried out as a measure of last resort.

In practice, a combination of the above management options would be recommended. In this respect, where transfer, removal or disturbance is likely required, a license in terms of the Northern Cape Conservation Act, would be required prior to the undertaking of any such actions. The following quantities, based on observations and statistical estimation should be applied for in order to increase the likelihood that all affected botanical specimens within the site are accounted for:

Table 3. Species and quantity of specimens that are to be included in the applicable permits.

Species	Quantity
<i>Aloidendron dichotomum</i>	2
<i>Dinteranthus pole-evansii</i> population	1
<i>A albissima</i> population	2

The presence of listed and protected fauna on the site is unlikely and where encountered, species are generally transient across site or in the case of some invertebrates, may be using the site for the establishment of burrow refugia. Lastly, it is recommended that a final walk through of the facility area be carried out by the appointed ECO prior to construction in order to log species of significance that may have been previously undetected.

Annexure A - Botanical species check list within the Kenhardt area according to POSA.

Species	Observations	CONS importance
<i>Schwantesia triebneri</i>	POSA	LC
<i>Jamesbrittenia integerrima</i>	POSA	LC
<i>Mesembryanthemum</i> sp.	POSA	LC
<i>Drosanthemum</i> sp.	POSA	Threatened
<i>Galenia secunda</i>	POSA	LC
<i>Zaluzianskya diandra</i>	POSA	Not listed
<i>Hermbstaedtia glauca</i>	POSA	Not listed
<i>Jamesbrittenia aurantiaca</i>	POSA	LC
<i>Jamesbrittenia canescens</i>	POSA	LC
<i>Indigofera alternans</i>	POSA	Not listed
<i>Helichrysum micropoides</i>	POSA	LC
<i>Heliophila deserticola</i>	POSA	LC
<i>Jamesbrittenia adpressa</i>	POSA	LC
<i>Jamesbrittenia atropurpurea</i>	POSA	LC
<i>Tetragonia arbuscula</i>	POSA	LC
<i>Justicia distichotricha</i>	POSA	Not listed
<i>Acacia</i> sp.	POSA	Not listed
<i>Kohautia caespitosa</i>	POSA	LC
<i>Senna italica</i>	POSA	NE
<i>Mesembryanthemum coriarium</i>	POSA	LC
<i>Vachellia karroo</i>	POSA	LC
<i>Jamesbrittenia maxii</i>	POSA	LC
<i>Pomaria lactea</i>	POSA	LC
<i>Lessertia frutescens</i>	POSA	LC
<i>Mesembryanthemum noctiflorum</i>	POSA	Not listed

<i>Ruschia divaricata</i>	Onsite observation	LC
<i>Titanopsis hugo-schlechteri</i>	POSA	LC
<i>Dyerophytum africanum</i>	POSA	LC
<i>Lessertia incana</i>	POSA	LC
<i>Stipagrostis brevifolia</i>	POSA	LC
<i>Dinteranthus puberulus</i>	POSA	LC
<i>Sericocoma avolans</i>	POSA	LC
<i>Conophytum fulleri</i>	POSA	LC
<i>Phaeoptilum spinosum</i>	POSA	LC
<i>Anacampseros albissima</i>	POSA	LC
<i>Indigastrum niveum</i>	POSA	LC
<i>Mesembryanthemum lignescens</i>	POSA	
<i>Conophytum sp.</i>	POSA	
<i>Kewa salsoloides</i>	POSA	LC
<i>Kohautia cynanchica</i>	POSA	LC
<i>Mesembryanthemum latipetalum</i>	POSA	
<i>Mesembryanthemum excavatum</i>	POSA	
<i>Aptosimum spinescens</i>	POSA	LC
<i>Manulea schaeferi</i>	POSA	LC

Annexure B - Raw data sheet presenting the calculations of St deviation.

	B albitrunca	A dichotomum	D pole-evansii pop	A albissima pop	A clariflora	A hereroensis	R spp pop	E braunsii	H Gordonii	L cactiformis	Sarcocaulon spp pop
PV 2	4	2	0	0	0	0	0	0	0	0	0
PV 3	0	1	1	1	0	0	0	0	0	0	0
PV 4	3	2	0	2	1	2	0	1	0	0	0
PV 5	4	1	0	0	0	0	0	0	1	1	0
PV 6	3	3	0	2	1	0	0	0	0	0	1
Access Road	0	0	0	0	0	0	1	0	0	0	0
Total	14	9	1	5	2	2	1	1	1	1	1
Mean	2,8	1,6	0,2	5	0,4	0,4	0,2	0,2	0,2	0,2	0,2
St Dev	1,64	1,14	0.4472	1	0,55	0,89	0.4472	0,45	0,45	0,45	0.4472
Number of estimated individuals to be added to each site (St rounded off)	2	1	0	1	1	1	0	0	0	0	0
Total number of estimated individuals to be added	10	5	0	5	5	5	0	0	0	0	0
Total number of individuals applied for with regards to permit applications	24	14	1	10	7	7	1	1	1	1	1

