



Karpowership Avifauna Monitoring Plan

Richards Bay, KwaZulu-Natal, South Africa

September 2022

CLIENT



Prepared by:

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Submitted to	
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Declaration	<p>The Biodiversity Company and its associates operate as independent consultants under the auspice of the South African Council for Natural Scientific Professions. We declare that we have no affiliation with or vested financial interests in the proponent, other than for work performed under the Environmental Impact Assessment Regulations, 2014 (as amended). We have no conflicting interests in the undertaking of this activity and have no interests in secondary developments resulting from the authorisation of this project. We have no vested interest in the project, other than to provide a professional service within the constraints of the project (timing, time and budget) based on the principles of science.</p>

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DECLARATION

I, Leigh-Ann de Wet, declare that:

- I act as the independent specialist in this application;
- I will perform the work relating to the application in an objective manner, even if this results in views and findings that are not favourable to the applicant;
- I declare that there are no circumstances that may compromise my objectivity in performing such work;
- I have expertise in conducting the specialist report relevant to this application, including knowledge of the Act, regulations and any guidelines that have relevance to the proposed activity;
- I will comply with the Act, regulations and all other applicable legislation;
- I have no, and will not engage in, conflicting interests in the undertaking of the activity;
- I undertake to disclose to the applicant and the competent authority all material information in my possession that reasonably has or may have the potential of influencing any decision to be taken with respect to the application by the competent authority; and the objectivity of any report, plan or document to be prepared by myself for submission to the competent authority;
- All the particulars furnished by me in this form are true and correct; and
- I realise that a false declaration is an offence in terms of Regulation 71 and is punishable in terms of Section 24F of the Act.



Leigh-Ann de Wet
Terrestrial Ecologist
The Biodiversity Company
September 2022

DECLARATION

I, Andrew Husted, declare that:

- I act as the independent specialist in this application;
- I will perform the work relating to the application in an objective manner, even if this results in views and findings that are not favourable to the applicant;
- I declare that there are no circumstances that may compromise my objectivity in performing such work;
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- I undertake to disclose to the applicant and the competent authority all material information in my possession that reasonably has or may have the potential of influencing any decision to be taken with respect to the application by the competent authority; and the objectivity of any report, plan or document to be prepared by myself for submission to the competent authority;
- All the particulars furnished by me in this form are true and correct; and
- I realise that a false declaration is an offence in terms of Regulation 71 and is punishable in terms of Section 24F of the Act.



Andrew Husted

Terrestrial Ecologist

The Biodiversity Company

September 2022

1 Introduction

The Biodiversity Company was commissioned to set up and perform an avifauna monitoring programme for the Powership project in the Port of Richards Bay, KwaZulu-Natal, South Africa. The monitoring is to occur monthly both prior, during, and for 1 year post construction phase of the project (should Environmental Authorization be received).

Long term monitoring provides a comprehensive view into the ecology, environmental changes and management of the natural resources (Lindenmayer *et al.*, 2012). The monitoring will help to determine the extent of these changes and if and how it must be managed should the effect be extensive.

1.1 Project description

Karpowership proposes to locate a Powership project at the Port of Richards Bay to generate electricity from natural gas and evacuate the electricity through a transmission line to a substation linking to the national grid. Three ships will be berthed at any one time - a Floating Storage Regasification Unit (FSRU) and two Powerships. A Liquefied Natural Gas Carrier will supply the Liquid Natural Gas (LNG) to the FSRU over a one to two day period approximately every 20 to 30 days. The natural gas (NG) will be pumped from the FSRU to the Powership via a gas pipeline.

The proposed capacity for the Richards Bay Powership project is 450MW, which comprises of 27 gas reciprocating engines having an approximate heat input of over 10MW each. The 3 steam turbines have a heat input of 15.45MW each. The power that is generated is then converted by the on-board High Voltage substation and the electricity evacuated via a 132kV transmission line over a distance of approximately 3 km from the Richards Bay Port tie in point to the Eskom line, at a connection point (necessitating a new switching station) in proximity to the existing Bayside Substation, which feeds into the national grid.

1.2 Locality

The project is located in the KwaZulu-Natal Province, in the Port of Richards Bay (Figure 1-1). This in turn is located in Ward 2 of the Mhlathuze Local Municipality and the King Cetshwayo District Municipality (Figure 1-2).

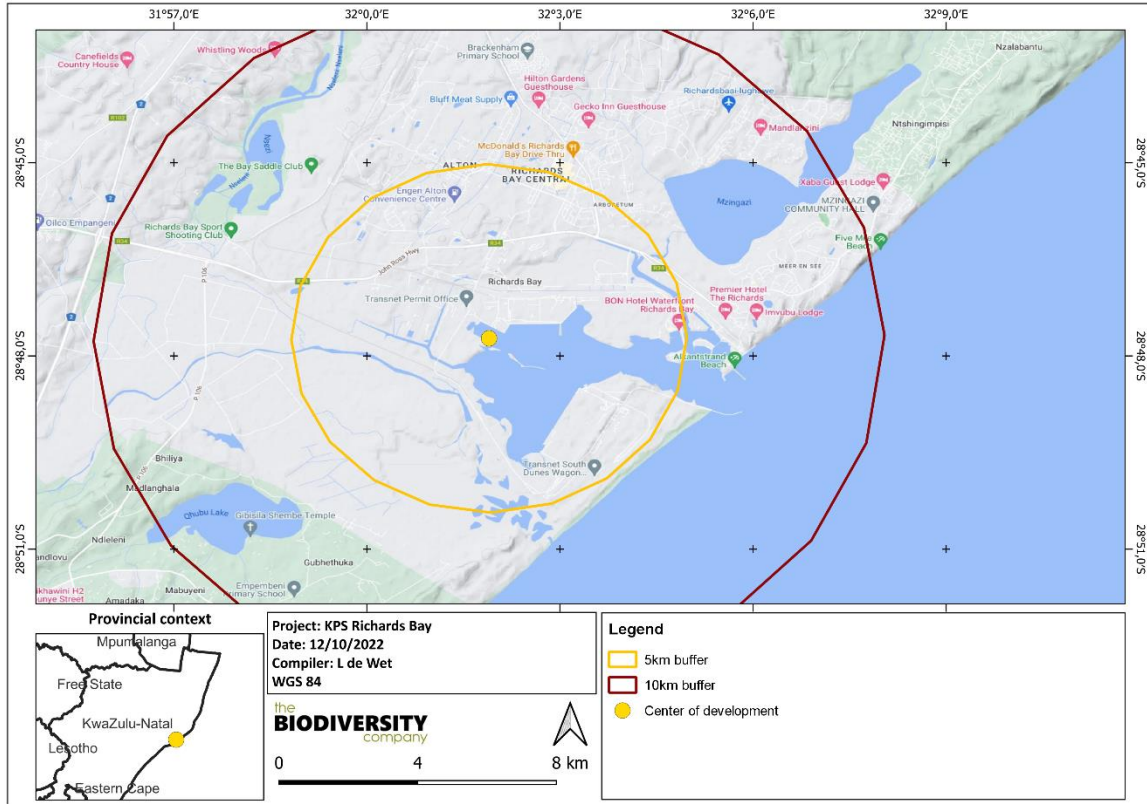


Figure 1-1 The project area location

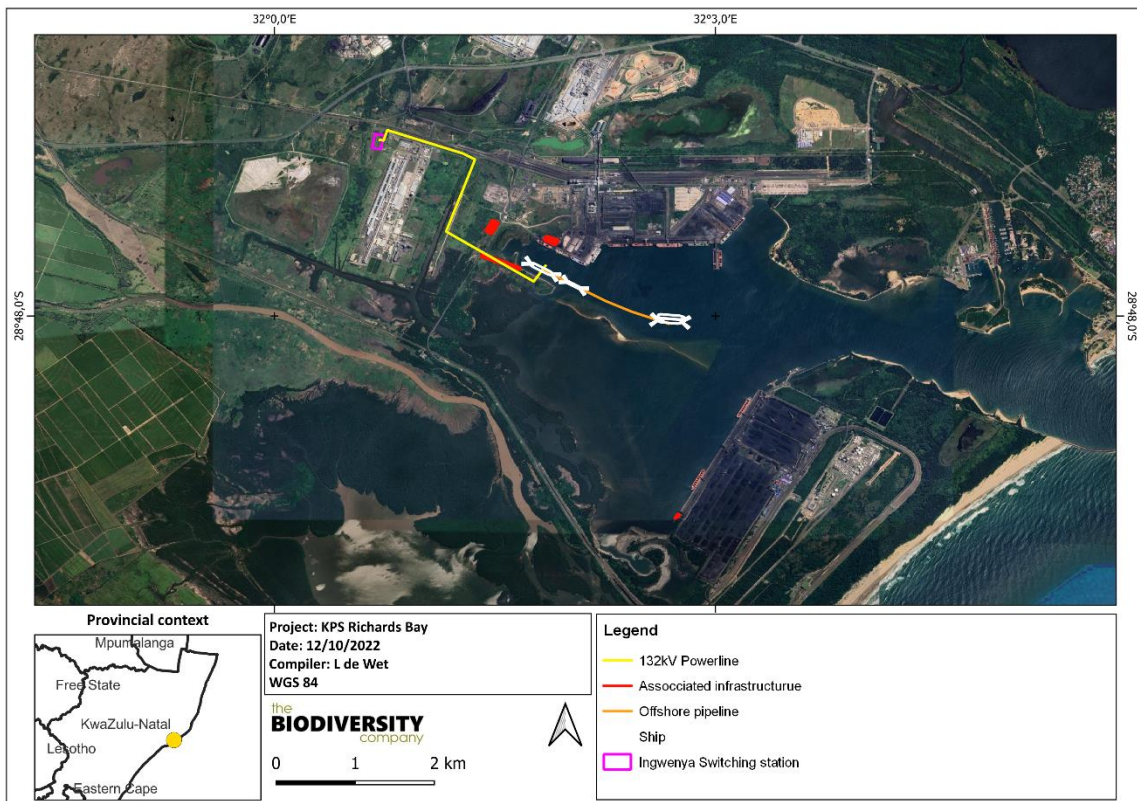


Figure 1-2 The project layout

1.3 Objectives of this plan

Developments that disturb natural landscapes introduce anthropogenic disturbance, which reduces the overall conservation value of the landscape. In addition, Species of Conservation Concern (SCC) are affected by disturbance. In order to gauge the potential impact of a proposed development on the avifaunal habitats and species associated with it, a full idea of the current status quo must be gathered. Ordinarily, a snapshot of the habitats and species making use of a Project Area of Influence (PAOI) in the form of one or two site visits are made. In this case, where the site is said to be of international importance, data gathering with evaluation is required to refute or conform this hypothesis.

For this reason, monitoring monthly using CWAC methodology will be performed for the sensitive habitats identified for the proposed Karpowership project (KPS). Sensitive habitats include primarily the sand spit and the associated Kabeljous flats within the Port of Richards Bay. The monthly monitoring aims to record species and numbers of each species that make use of the sensitive habitats throughout the year and aims to capture primarily the use of these features by not only SCC but also migratory waders. Migratory waders have been identified as a particularly sensitive group that have been known to occur in the region in globally significant numbers and are also governed by the Bonn Convention, of which South Africa is a signatory.

Current threats to avifauna within the Port of Richards Bay and, more specifically, the sand spit and associated Kabeljous flats include:

- Disturbance due to noise associated with port activities;
- Pollution as a result of port activities including the spread of coal dust, and oil spills;
- Disturbance of foraging habitats by moving water craft;
- Collisions with port infrastructure; and
- Loss of roosting and feeding grounds as a result of port development.

This monitoring plan lays out what must be done in order to gather the data necessary to determine baseline avifauna data which may then be compared to post construction data as well as to elucidate the potential impacts of the KPS project on the avifauna of the sensitive habitats of the port of Richards Bay. Data over the years is not complete and this monitoring will add to the existing body of data which will aid in determining trends and to relate these trends to the Karpowership project during the operational phase as far as is practically possible. The monitoring plan will also inform potential projects to be done in conjunction with the Port and EKZN Wildlife to better understand changes in avifauna species and possible long-term interventions to improve biodiversity.

2 Description of the Avifauna of the monitoring environment

2.1 Important Bird and Biodiversity Areas (IBA)

Important Bird and Biodiversity Areas (IBAs) are areas internationally recognized for their importance for birds, and thus internationally important for conservation. The Richards Bay Game Reserve is an IBA and is located less than 1km from the site (Figure 2-1).

The Richards Bay Game Reserve is located 190km north of Durban and is administered by eZemvelo KwaZulu-Nata Wildlife (EKZNW) (Birdlife 2015). It came into being when the development of a harbour cut the Richards Bay estuary in two with a 4km causeway. Harbour and industrial development proceeded in the north-east (Birdlife 2015). The IBA covers the Mhlathuze estuary and does not include the Port of Richards Bay where the Karpowership project is to be located.

The south-western area was left undisturbed as a nature reserve (sanctuary) with a vibrant estuary (Birdlife 2015). The *Rhizophora* mangroves in the reserve represents the best surviving population in KwaZulu-Natal. A well-preserved remnant of climax coastal dune forest is found here. The estuary, however, is under threat from pollution, silt deposition and loss of habitat caused by the industrialisation. In addition, the dynamics of the area were changed by canalising rivers and draining floodplains for sugar cane cultivation (Birdlife 2015).

The reserve's wetland supports a complex community of more than 10 000 waterbirds (Birdlife 2015). The avifauna is diverse, largely as a result of the mosaic nature of the vegetation along the water's edge, and the fact that several species reach the most southerly limit of their Afro-tropical distribution here (Birdlife 2015).

Species triggering a site to be considered as an IBA include the following: "Regionally threatened species are Pink-backed Pelican *Pelecanus rufescens* (1–35 individuals), Caspian Tern *Sterna caspia* (4–50 individuals), Mangrove Kingfisher *Halcyon senegaloides*, Great White Pelican *Pelecanus onocrotalus* (1–140 individuals) and Greater Flamingo *Phoenicopterus roseus* (1–97 individuals). Species that surpass the 0.5% population threshold are Little Tern *Sterna albifrons* (16–700 individuals) and Whiskered Tern *Chlidonias hybrida* (1–200 individuals) (Birdlife 2015)".

This IBA has been downlisted from a global to a sub-regional IBA, following surveys (2008) indicating that the site may only *occasionally* surpass the 10 000-waterbird threshold (Birdlife 2015). Historically, more than 20 000 (qualifying the site for global IBA status) were regularly recorded, with up to 50 000 birds during summer migrations. The nearby Thulazihleka Pan, previously part of the IBA, has now been excluded because it is heavily polluted and no longer supports significant numbers of waterbirds (Birdlife 2015).

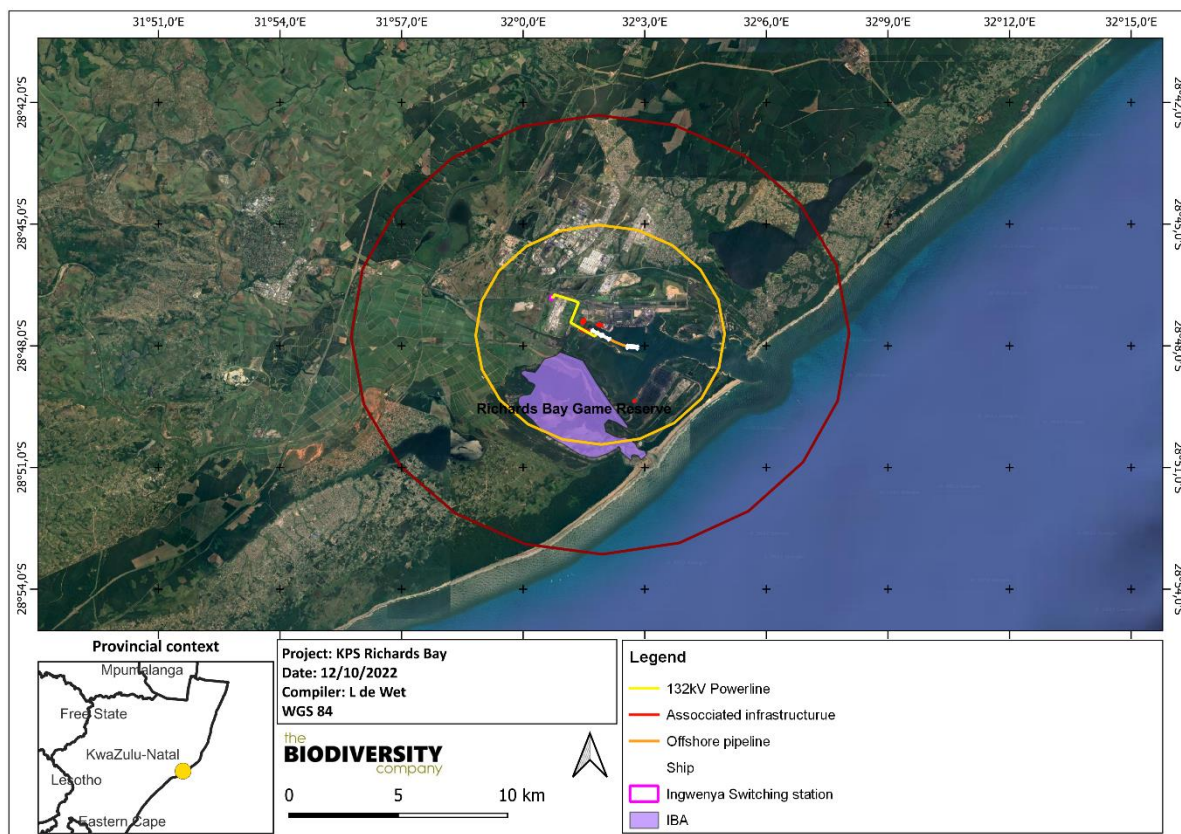


Figure 2-1 IBA areas near to the site.

2.2 Expected Avifauna

2.2.1 South African Bird Atlas Project 2

Based on the South African Bird Atlas Project, Version 2 (SABAP2) database, 354 species have been recorded in the pentad in which the study area falls over all recorded years. The full list of these species can be found in Appendix B. Of the potential bird species, 24 are listed on either a regional or global scale (Table 2-1). The SCC include:

- Eight (8) that are listed as Endangered (EN);
- Nine (9) that are listed as Vulnerable (VU); and
- Seven (7) that are listed as Near Threatened (NT)

Each of these species has been rated according to likelihood of occurrence, which is predicated on the presence of suitable habitat within the study area, if the species has been recorded during the site survey and habitat quality of present habitats. Also taken into consideration is the reporting frequency for the SABAP2 dataset.

Table 2-1 SAPAB2 Species of Conservation Concern expected for the study site and immediate surrounds

Scientific name	Common name	IUCN	Likelihood of occurrence
<i>Aquila rapax</i>	Tawny Eagle	EN	Low
<i>Circus ranivorus</i>	African Marsh-harrier	EN	High
<i>Stephanoaetus coronatus</i>	African Crowned Eagle	VU	Moderate
<i>Alcedo semitorquata</i>	Half-collared Kingfisher	NT	Moderate
<i>Halcyon senegaloides</i>	Mangrove Kingfisher	EN	Definite (previously recorded)
<i>Ephippiorhynchus senegalensis</i>	Saddle-billed Stork	EN	Moderate
<i>Mycteria ibis</i>	Yellow-billed Stork	EN	Moderate
<i>Coracias garrulus</i>	European Roller	NT	Definite (recorded)
<i>Falco biarmicus</i>	Lanner Falcon	VU	Moderate
<i>Balearica regulorum</i>	Grey Crowned Crane	EN	Low
<i>Podica senegalensis</i>	African Finfoot	VU	Moderate
<i>Microparra capensis</i>	Lesser Jacana	NT	Moderate
<i>Sterna caspia</i>	Caspian Tern	VU	High
<i>Lissotis melanogaster</i>	Black-bellied Bustard	NT	Low
<i>Neotis denhami</i>	Denham's Bustard	VU	Low
<i>Pelecanus onocrotalus</i>	Great White Pelican	VU	Definite (recorded)
<i>Pelecanus rufescens</i>	Pink-backed Pelican	VU	Definite (recorded)
<i>Phalacrocorax capensis</i>	Cape Cormorant	EN	Moderate
<i>Phoenicopterus minor</i>	Lesser Flamingo	NT	Low
<i>Phoenicopterus ruber</i>	Greater Flamingo	NT	Definite (recorded)
<i>Rostratula benghalensis</i>	Greater Painted-snipe	VU	Low
<i>Numenius arquata</i>	Eurasian Curlew	NT	Moderate
<i>Morus capensis</i>	Cape Gannet	VU	Low
<i>Zoothera guttata</i>	Spotted Ground-thrush	EN	Low

2.2.2 Coordinated Avifaunal Roadcount (CAR)

Coordinated Avifaunal Roadcounts (CAR) are counts of large species of terrestrial birds along over 300 routes within South Africa (CAR 2020). Standardised counts are performed in two seasons, January (summer) and July (winter). The counts are used to monitor populations of birds such as cranes, bustards, storks and korhaans which can then be used to model population change over time. This can then be assessed against impacts from renewable energy projects (wind and solar), transmission lines and agriculture (CAR 2020). No CAR routes are located within or around the study area.

2.2.3 Coordinated Waterbird Counts (CWAC)

The Coordinated Waterbird Counts (CWAC) are administered by the Animal Demography Unit (ADU) and started in 1992 and has been run by the University of Cape Town's FitzPatrick

Institute of African Ornithology since 2018 (CWAC 2021). It involves coordinated counts of waterbirds in wetlands all over South Africa twice a year in summer and winter (February and July). Counts are conducted by volunteers and the data is used for waterbird conservation. Over 400 wetlands are monitored throughout the country. The aim of the counts is to provide long-term waterbird monitoring through the provision of data sourced through standardized protocols (CWAC 2021).

The Richards Bay CWAC count area includes an open estuary (including Mhlatuze Lagoon), permanent marsh and season wetlands (whereas the Richards Bay Game Reserve IBA is restricted to the Umhlatuze estuary and does not extend into the Port of Richards Bay where the Karpowership project occurs) (CWAC 2021) (Figure 2-2). It is used by a wide variety of birds but has experienced a decline (referring to datasets prior to and including 2012) in species numbers. An exceptional count was produced in 1996 due to the presence of 13 000 Common Tern, a globally significant number and record counts of Crested and Little Terns. Common species recorded here include Reed Cormorant, Woolly-necked Stork, Caspian Tern and Whimbrel. Threats are extensive as the Industrial Development Zone (IDZ) and port area are expanded and further industrialised and include sedimentation, clearing of vegetation, drainage and reclamation of wetlands and pollution (CWAC 2021).



Figure 2-2 Boundaries of the Richards Bay CWAC survey area including both the Richards Bay Game Reserve and the Richards Bay Port.

The full species list for CWAC (1993 to 2012) surveys can be found in Appendix C and includes 101 bird species. These have been recorded in the study area and so are considered confirmed present. However, as habitat degradation and impacts have been present since the last count in 2012, it is considered that lower numbers are expected in the present. Of the 101 species recorded from the site, fourteen are red listed which include six (6) listed as Endangered (EN), three (3) listed as Vulnerable (VU) and five (5) that are listed as Near Threatened (Table 2-2).

Table 2-2 CWAC Species of Conservation Concern recorded from the study area (1993 to 2012)

Scientific name	Common name	IUCN
<i>Phalacrocorax capensis</i>	Cormorant, Cape	EN
<i>Balearica regulorum</i>	Crane, Grey Crowned	EN
<i>Halcyon senegaloides</i>	Kingfisher, Mangrove	EN
<i>Circus ranivorus</i>	Marsh-harrier, African	EN
<i>Catharacta antarctica</i>	Skua, Subantarctic	EN
<i>Mycteria ibis</i>	Stork, Yellow-billed	EN
<i>Numenius arquata</i>	Curlew, Eurasian	NT
<i>Phoenicopterus ruber</i>	Flamingo, Greater	NT
<i>Phoenicopterus minor</i>	Flamingo, Lesser	NT
<i>Microparra capensis</i>	Jacana, Lesser	NT
<i>Charadrius pallidus</i>	Plover, Chestnut-banded	NT
<i>Pelecanus onocrotalus</i>	Pelican, Great White	VU
<i>Pelecanus rufescens</i>	Pelican, Pink-backed	VU
<i>Sterna caspia</i>	Tern, Caspian	VU

2.2.4 History of the Avifauna of Richards Bay and the importance of the sandspit and Kabeljous flats

The Richards Bay IBA is restricted to the Mhlathuze estuary (it does not include the Port of Richards Bay in which the Karpowership project is located) and is currently a regional IBA based on 2008 data of birds occurring in the IBA as well as within the CWAC boundaries as birds move freely between the IBA and Richards Bay Port. CWAC counts are for the IBA and do not necessarily include the Port of Richards Bay. There is a large gap in the data for the region with the following timeline of available data:

Date	Counts
1986	Counts by Ryan <i>et al.</i> 1986
1987	No data
1988	No data
1989	No data
1990	No data
1991	No data
1992	No data

Date	Counts					
	first	CWAC	counts	summer	and	winter
1993	http://cwac.birdmap.africa/cards_site.php?locationCode=28493202					
1994	CWC counts summer and winter					
1995	CWC counts summer and winter					
1996	CWC counts summer and winter					
1997	CWC counts summer and winter					
1998	CWC counts summer and winter					
1999	CWC counts summer and winter					
2000	CWAC counts summer					
2001	CWAC counts summer and winter					
2002	CWAC counts summer and winter counts by Allan and McInnes 2002					
2003	CWAC counts summer					
2004	CWAC counts summer					
2005	No data					
2006	No data					
2007	No data					
2008	CWAC counts summer					
2009	Counts by Allan 2009					
2010	CWAC counts winter					
2011	CWAC counts winter					
2012	CWAC counts winter					
2013	No data					
2014	No data					
2015	No data					

Date	Counts
2016	No data
2017	No data
2018	No data
2019	No data
2020	Counts by Cyrus and Vivier 2021 (summer) covering the Port of Richards Bay
2021	Counts by de Wet 2021 (autumn) covering the Port of Richards Bay
2022	Monitoring counts by de wet 2022 (autumn and winter) covering the Port of Richards Bay

As the last CWAC surveys were conducted in 2012 (10% of the habitat covered) and Allan 2009 did a comprehensive survey, there is a lack of data from 2009 until 2020 when Cyrus and Vivier (2021) did their counts. This is a data gap of 11 years. In this time, the continued decline in the bird populations as well as the presence and numbers of conservation important species was noted.

The sand spit has changed drastically during the time period in which these counts took place, and the mangroves associated with the sand spit have also changed dramatically with the stands decreasing in size significantly over time, with some stands completely dead (Figure 2-3). This could be due to natural variation as a result of changes in tidal height or freshwater inflow. This habitat is variable in nature.

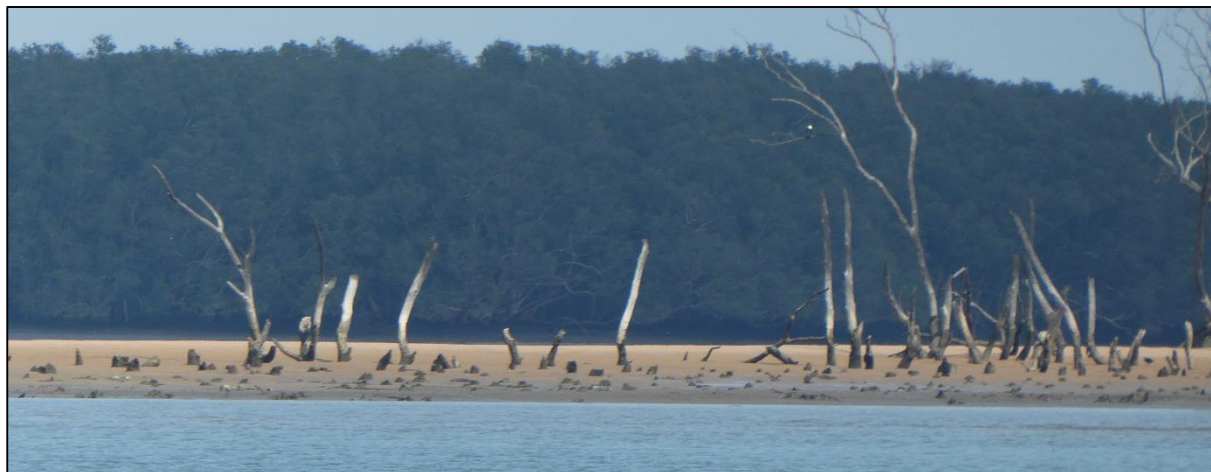


Figure 2-3 Sand spit at low tide showing dead mangrove stands.

3 Methodology for the monitoring

3.1 Desktop Assessment

Previous studies must be taken into consideration including the de Wet 2021 assessment for the proposed Karpowership project. In addition, the following must be checked:

- Google earth imagery to determine the current vegetation cover and microhabitats of the site;
- A literature review of avifaunal species that are likely to be impacted by the nature of the proposed development;
- Conservation Planning Tools such as the List of Ecosystems that are Threatened and in Need of Protection, Wetlands datasets, Important Bird Areas and the KwaZulu-Natal Biodiversity Plan;
- An expected bird list for the site must be generated using the most recent available data:
 - South African Bird Atlas Project 2 (SABAP2);
 - Coordinated Water Bird Counts (CWAC); and
 - Coordinated Avifaunal Road Counts (CAR) (if applicable).
- A list of Possible Species of Conservation Concern (SCC) must be extracted from the expected list of birds recorded from the Richards Bay area and surrounds though checking the list of recorded species against the following most recent lists:
 - The National Red List for Bird; and
 - The international IUCN Red Data List.
- The important species must be cross referenced with the:
 - Provincial Protected Species List (Nature Conservation Ordinance No 15 of 1974); and
 - National Protected Species List or TOPS (R 1187 of 2007).

3.2 Field Assessment

Boat surveys must coincide with low tide to allow for maximum observable wader habitat and with high tide to determine any changes or increases in bird numbers at the sample points (Figure 3-1).

Sampling must comprise the following methods:

- **Boat survey.** A boat survey must be conducted at both high and low tide for the sand spit. Bird counts on the sand spit must follow CWAC methodology from a boat varying in distance from the sandspit 10 to 50 m away. All birds on the sandspit must be counted.

The method used must be CWAC counts:

- **CWAC counts** (Appendix B). These involve the use of the CWAC survey methodology and all water birds present in a particular area from a vantage point on a stationary boat must be counted. In some instances, these may be conducted via a slow-moving boat for larger sections with fewer birds (individuals as opposed to flocks). Details of the CWAC methodology can be found at http://cwac.birdmap.africa/instructions_protocol.php. Land-based birds must also be counted whether seen or heard to be added to the incidental's lists.

Birds must be identified using an accepted field guide or app such as Roberts.

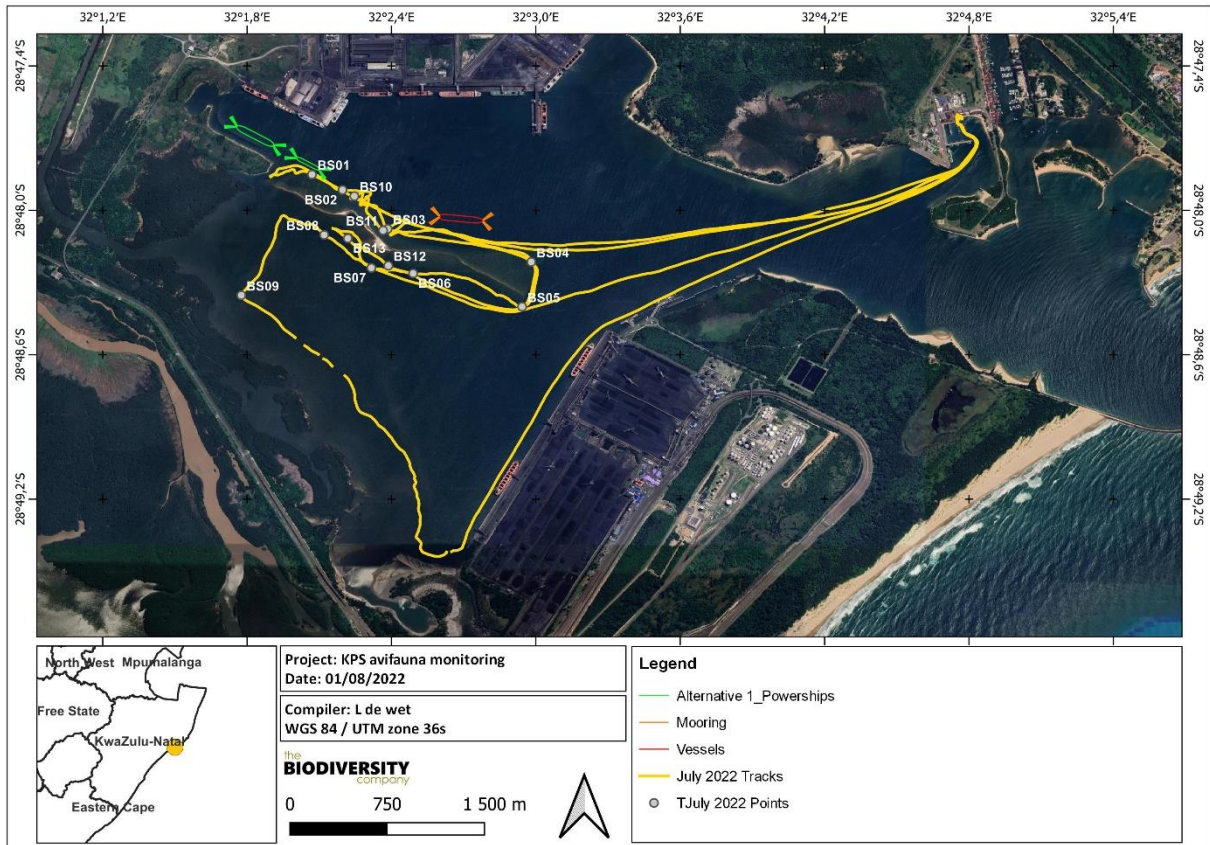


Figure 3-1 Map of recommended sampling points

3.3 Equipment

The following equipment must be used for the Avifaunal Survey:

- 8x10 binoculars;
- A GPS;
- A camera suitable for bird photography;
- Bird field guide and/or app
- Notebook and pen;

- CWAC survey guidelines; and
- CWAC survey data sheets (appendix B).

4 Monitoring Plan

The focus of monitoring for the proposed project is the sensitive areas that are present within 500 m of the site and which include the sand spit and associated Kabeljous flats flanked by mangroves on the land side. Access is not possible by land, and monitoring must be conducted by boat and adhere to the rules and regulations sets out by the port of Richards Bay Transnet National Ports Authority (TNPA).

The monitoring plan is designed to be relatively simple to complete, using as little equipment as possible to allow for it to be easily repeatable over the years and not reliant on a single person conducting the monitoring in perpetuity.

Monitoring is to be conducted monthly for 12 months prior to establishment and then an additional 12 months during operation (predicated on receiving Environmental Authorisation) (predicated on receiving Environmental Authorisation) to have a comparable 12-month dataset as per best practice. Monitoring must occur within a week of the 25th of the month to provide continuity between datasets, that is the 4th week of each month. Thereafter, monitoring must continue but may be reduced to seasonal monitoring twice a year.

The monitoring plan that follows in table format may be used as a stand-alone guide to the monitoring for the first 12 months. This should be considered an adaptive monitoring plan and must be re-evaluated every 3 months by the specialist conducting the monitoring to determine if it should be adjusted in any way based on new available information.

Reports must be produced each month and submitted to the client along with raw data. A more detailed report including comparison of the previous months will be written every six months. Data should also be submitted to Transnet and EKZN Wildlife for their records.

4.1 Avifaunal monitoring plan

Task	Method	Outcome	Frequency
Define different habitat areas	<ul style="list-style-type: none"> Map the habitat types on site 	<ul style="list-style-type: none"> Description of the available habitats 	Once, prior to monitoring beginning, Once, post establishment and again post 12 month operation monitoring
Recording of incidentally encountered species	<ul style="list-style-type: none"> During any activity on site, the specialist will note the date, time of any incidental sightings of avifauna. For each record of a priority species (those listed as CR or EN on the regional Red List) the following must be noted: <ul style="list-style-type: none"> Project name Date Observer/s Time Temperature Cloud cover Wind Strength/direction Visibility (good, moderate, poor) Species Number (number of adults/juveniles/chicks) Activity (flushed/flying display/fluming commute/ perched calling) GPS location of observer Habitat type/mix of habitats Additional notes 	<ul style="list-style-type: none"> A running list of incidental species encountered 	Incidentally
Recording of nests	<ul style="list-style-type: none"> All nests encountered opportunistically should be recorded Data recorded for each nest should include <ul style="list-style-type: none"> Project name Date Time Species Number making use of nest (adults/juveniles/chicks) GPS location of nest Habitat type/ mix of habitats 	<ul style="list-style-type: none"> A running list of nests encountered 	Incidentally

Task	Method	Outcome	Frequency
<p>Recording of carcasses</p>	<ul style="list-style-type: none"> • All carcasses encountered opportunistically should be recorded • Data recorded for each carcass should include <ul style="list-style-type: none"> ○ Project name ○ Date ○ Time ○ Species ○ Number (adults/juveniles) ○ GPS location ○ Condition of remains ○ Habitat type/ mix of habitats ○ Reason for death (if known) 	<ul style="list-style-type: none"> • A running list of carcasses encountered 	<p>Incidentally</p>
<p>Determine the avifauna present on the sand spit during low tide</p>	<ul style="list-style-type: none"> • Identify the species present on the sand spit • Count the numbers of each species present • Cover the full sand spit area in at least (but not limited to) 8 vantage point counts as per the map in Figure 4-1 • List the species, habitat, number, if they are perched or in flight and if in flight, the flight direction • Data collected for each point should include <ul style="list-style-type: none"> ○ Project name ○ Point number ○ Point GPS location at start and finish ○ Date ○ Observer/s ○ Start and finish time ○ Habitat type/mix of habitat types ○ Temperature at start ○ Cloud cover at start ○ Wind strength and direction at start ○ Visibility at start (good, moderate, poor) ○ Noise levels at start ○ Amount of pollution at start ○ Position of sun relative to direction of point (ahead, above, behind) • Data collected for each observation should include <ul style="list-style-type: none"> ○ Time ○ Species ○ Number (number of adults/juveniles/chicks) 	<ul style="list-style-type: none"> • A list of species per point count, the numbers of each species and whether they were perched or flying with flight direction 	<p>Monthly over 1 day per month for 12 months (for the first year)</p>

Task	Method	Outcome	Frequency
<p>Determine the avifauna present on the sand spit during high tide</p>	<ul style="list-style-type: none"> ○ Activity (flushed/flying display/flying commute/perched calling) ○ Seen or heard ○ Fixed radius of count ○ Additional notes 		
	<ul style="list-style-type: none"> ● Identify the species present on the sand spit ● Count the numbers of each species present ● Cover the full sand spit area in at least (but not limited to) 4 vantage point counts as per the map in Figure 4-1 ● List the species; habitat, number, if they are perched or in flight and if in flight, the flight direction ● Data collected for each point should include <ul style="list-style-type: none"> ○ Project name ○ Point number ○ Point GPS location at start and finish ○ Date ○ Observer/s ○ Start and finish time ○ Habitat type/mix of habitat types ○ Temperature at start ○ Cloud cover at start ○ Wind strength and direction at start ○ Visibility at start (good, moderate, poor) ○ Position of sun relative to direction of point (ahead, above, behind) ● Data collected for each observation should include <ul style="list-style-type: none"> ○ Time ○ Species ○ Number (number of adults/juveniles/chicks) ○ Activity (flushed/flying display/flying commute/perched calling) ○ Seen or heard ○ Fixed radius of count ○ Additional notes 	<ul style="list-style-type: none"> ● A list of species per point count, the numbers of each species and whether they were perched or flying with flight direction 	<p>Monthly over 1 day per month for 12 months (for the first year)</p>

Task	Method	Outcome	Frequency
<p>Determine the avifauna present on the Kabeljous flats and associated flanking mangroves</p>	<ul style="list-style-type: none"> • Identify the species present • Count the numbers of each species present • Cover the full Kabeljous flats area in a slow-moving boat scanning with binoculars from the sand spit to the coal facility • List the species, number, if they are perched or in flight and if in flight, the flight direction • Data collected for each point should include <ul style="list-style-type: none"> ○ Project name ○ Point number ○ Point GPS location at start and finish ○ Date ○ Observer/s ○ Start and finish time ○ Habitat type/mix of habitat types ○ Temperature at start ○ Cloud cover at start ○ Wind strength and direction at start ○ Visibility at start (good, moderate, poor) ○ Position of sun relative to direction of point (ahead, above, behind) • Data collected for each observation should include <ul style="list-style-type: none"> ○ Time ○ Species ○ Number (number of adults/juveniles/chicks) ○ Activity (flushed/flying display/flying commute/perched calling) ○ Seen or heard ○ Fixed radius of count ○ Additional notes 	<ul style="list-style-type: none"> • A list of species for the area, the numbers of each species and whether they were perched or flying with flight direction 	<p>Monthly over 1 day per month for 12 months (1 year)</p> <p>A template for data capture is presented in Appendix D</p>



Figure 4-1 Map of recommended sampling points. BS01 to BS09 being low tide, with BS10 to BS14 being high tide

5 References

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- Buckland, S.T.; Anderson, D.R.; Burnham, K.P.; Laake, J.L. 1993. Distance sampling: Estimating abundance of biological populations. Chapman and Hall, London, UK.
- Coordinated Avifaunal Roadcounts (CAR) (2020). <http://car.birdmap.africa/index.php> (Accessed: June 2021)
- Coordinated Waterbird Counts (CWAC) (2021). <http://cwac.birdmap.africa/> (Accessed: June 2021)
- Lindenmayer, D.B., Liens, G.E., Anderson, A., Bowman, D., Bull, C.M., Burns, E., Dickman, C.R., Hoffman, A.A., Keith, D.A., Liddell, M.J., Lowe, A.J., Metcalfe, D.J., Phinn, S.R., Russell Smith, J., Thurgate, N., Wardle, G.M (2021). Value of long-term ecological studies. Austral Ecology. Vol 37 issue 7.
- Ryan, P.G., Cooper, J., Hockey, P.A.R. & Berruti, A. 1986. Waders (Charadrii) and other water birds on the coast and adjacent wetlands of Natal, 1980-1981. *Lammergeyer* 36: 1-33.

6 Appendix A: Specialist CVs

Leigh-Ann de Wet

M.Sc Botany (*Pr Sci Nat*)

Cell: +27 83 352 1936

Email: leigh-ann@thebiodiversitycompany.com

Identity Number: 8209010127081

Date of birth: 1 September 1982



Profile Summary

Working experience throughout South Africa, Southern Africa West and Central Africa and also Madagascar.

Specialist experience in exploration, mining, engineering, hydropower, private sector and renewable energy.

Experience with project management for national and international biodiversity projects.

Experience with IFC Performance Standards, Critical Habitat and High Conservation Value Assessments. Experience in numerous vegetation and habitat types throughout Africa,

Specialist expertise includes botany, forest ecology, avifauna and terrestrial fauna. Methodology development, conservation management and terrestrial monitoring.

Areas of Interest

Forest ecology and ecosystem functionality.

Ecology and plant identification.

Field methodology.

Publication of scientific journals and articles.

Key Experience

- Familiar with World Bank, Equator Principles and the International Finance Corporation requirements.
- Familiar with High Conservation Value assessments as per ProForest guidelines.
- Conservation Management Plans.
- Flora assessments.
- Avifauna assessments.
- Terrestrial fauna assessments.
- Monitoring.
- Ecosystem services
- Rehabilitation Plans.
- Alien Invasive Plant Management Plans.
- Permitting.

Country Experience

Mozambique,
Malawi,
Zambia,
Madagascar,
Liberia,
Guinea'
Democratic Republic of the Congo,
South Africa

Nationality

South African

Languages

English – Proficient

Afrikaans – Conversational

Zulu - Basic

Qualifications

- MSc (Rhodes University) – Botany.
- BSc Honours (Rhodes University) – Botany
- BSc Natural Science (Botany and Entomology)
- Pr Sci Nat (400233/12)
- Certificate of Competence: UFS Introduction to wetland delineation.
- Certificate of Competence: UFS Introduction to wetland law
- Certificate of competence: Africa Land Use Training Grass Identification (long and short course)
- Certificate of Competence: ASI Snake Awareness, first aid for snake bite and venomous snake handling.

SELECTED PROJECT EXPERIENCE

Project Name: The Environmental Impact Assessment for the Kiwano Solar PV facility

Personal position / role on project: Avifauna specialist.

Location: South Africa (2022).

Main project features: To determine the current status of the avifauna

Project Name: The Environmental Impact Assessment for the Kangela Umsinde Grid

Personal position / role on project: Specialist Terrestrial Ecologist and Avifauna specialist.

Location: South Africa (2022).

Main project features: To determine the current status of the avifauna and terrestrial biodiversity.

Project Name: The Environmental Impact Assessment for the Karpowership Project including ships, and associated terrestrial infrastructure in Richards Bay, Coega and Saldanha Bay, South Africa.

Personal position / role on project: Specialist Terrestrial Ecologist and Avifauna specialist.

Location: South Africa (including KZN, Eastern and Western Cape) (2021).

Main project features: To determine the current status of the avifauna and terrestrial biodiversity.

Project Name: A biodiversity baseline and impact assessment for the proposed Siguiri Gold Mine Project, in Kankan Province, Guinea.

Personal position / role on project: Botanist

Location: Guinea

Main project features: To conduct a dual season ecological baseline assessment for the expected impact footprint area. The study was required to meet national and IFC requirements, including a Critical Habitat assessment.

Project Name: The Environmental Impact Assessment for the proposed Sibaya Node 6 development, Umdloti, South Africa.

Personal position / role on project: Terrestrial Ecologist

Location: South Africa

Main project features: To conduct a flora and fauna specialist assessment of the proposed mixed use development location and determine the impacts associated with the proposed development in relation to terrestrial fauna and flora.

Project Name: Terrestrial Biodiversity Monitoring (including rehabilitation, alien vegetation and indigenous ecology) for the Sibaya Node 6 development, Umdloti, South Africa.

Personal position / role on project: Terrestrial Ecologist

Location: South Africa

Main project features: To conduct monthly monitoring for the Sibaya Node 6 development (Salta) for 6 months including completing a detailed Vegetation Assessment, Rehabilitation Plan, Plant Rescue Plan, Conservation Management Plan and Biodiversity Action Plan.

Project Name: The Environmental Impact Assessment for the proposed Roodeplaatwind energy facility, Eastern Cape, South Africa.

Personal position / role on project: Terrestrial Ecologist

Location: South Africa

Main project features: To conduct a flora and fauna specialist assessment of the proposed wind farm location and determine the impacts associated with the proposed development in relation to terrestrial fauna and flora. This included An Ecological Assessment, Rehabilitation Plan, Plant Rescue and Protection Plan, Open Space Management Plan and Alien Vegetation Management Plan.

Project Name: The Environmental Impact Assessment for the proposed Roodeplaatwind energy facility, Eastern Cape, South Africa.

Personal position / role on project: Terrestrial Ecologist

Location: South Africa

Main project features: To conduct a flora and fauna specialist assessment of the proposed wind farm location and determine the impacts associated with the proposed development in relation to terrestrial fauna and flora.

Project Name: Conservation Value Assessment for the City of Johannesburg (Little Falls Nature Reserve, Melville Koppies Nature Reserve, Ruimsig Butterfly Reserve and Rietfontein Nature Reserve)

Personal position / role on project: Terrestrial Ecologist

Location: Gauteng, South Africa

Main project features: Determination of the conservation potential and connectivity of four nature reserves within the City of Johannesburg including both fauna and flora.

Project Name: Feronia Palm Oil Projects, Including Boteka, Lokutu and Yaligimba, Democratic Republic of the Congo.

Personal position / role on project: Terrestrial Ecologist and HCV Specialist

Location: Democratic Republic of the Congo

Main project features: Determination and mapping of High Conservation Value areas within three oil palm plantations in the DRC to meet international best practice. Components including flora and fauna assessments as well as the integration of social aspects into the HCV assessment.

OVERVIEW

An overview of the specialist technical expertise includes the following:

- Terrestrial Ecological baseline assessments and categorization of the current condition of the environment.
- Ecosystem services for biodiversity, and the ecological and social interactions.
- Integration of specialist reports into IFC standard or HCV reporting.
- Design and adaptation of field methodology for assessment.
- Terrestrial Biodiversity offset strategy designs.
- Terrestrial rehabilitation plans.
- Monitoring plans for terrestrial systems.
- Faunal surveys which include mammals, birds, amphibians and reptiles.
- The design, compilation and implementation of Biodiversity and Land Management Plans and strategies.

EMPLOYMENT EXPERIENCE

The Biodiversity Company (March 2022 – Present)

Terrestrial Ecologist.

LD Biodiversity (August 2014 – March 2022)

Director and Terrestrial Ecologist

Digby Wells Environmental (July 2012 – September 2014)

Terrestrial Ecologist

Coastal and Environmental Services (March 2009 – June 2012)

Terrestrial Ecologist

PREVIOUS EMPLOYMENT: Rhodes University Department of Botany

Research Assistant

ACADEMIC QUALIFICATIONS

Rhodes University, Grahamstown, South Africa (2007): MAGISTER SCIENTIAE (MSc) - Botany:

Title: *Pollinator mediated selection in Pelargonium reniforme Curtis (Geraniaceae): Patterns and Process.*

Rand Afrikaans University (RAU), Johannesburg, South Africa (2004): BACCALAUREUS SCIENTIAE CUM HONORIBUS (Hons) – Botany

Rand Afrikaans University (RAU), Johannesburg, South Africa (2001 - 2004): BACCALAUREUS SCIENTIAE IN NATURAL AND ENVIRONMENTAL SCIENCES. Majors: Entomology and Botany.

PUBLICATIONS

Taylor, S, Ripley, B, Martin, T, **de Wet, L**, Woodward, I and Osborne, C (2014.) Physiological advantages of C4 grasses in the field: a comparative experiment demonstrating the importance of drought. *Global Change Biology* – in Press.

Ripley BS, **de Wet, L** and Hill MP (2008). Herbivory-induced reduction in photosynthetic productivity of water hyacinth, *Eichhornia crassipes* (Martius) Solms-Laubach (Pontederiaceae), is not directly related to reduction in photosynthetic leaf area. *African Entomology* 16(1): 140-142.

de Wet LR, Barker NP and Peter CI (2008). The long and the short of gene flow and reproductive isolation: Inter-Simple Sequence Repeat (ISSR) markers support the recognition of two floral forms in *Pelargonium reniforme* (Geraniaceae). *Biochemical Systematics and Ecology* 36: 684-690.

de Wet L, NP Barker and CI Peter (2006). Beetles and Bobartia: an interesting herbivore-plant relationship. *Veld & flora*. September: 150 – 151.

de Wet LR and Botha CEJ (2007). Resistance or tolerance: An examination of aphid (*Sitobion yakini*) phloem feeding on Betta and Betta-Dn wheat (*Triticum aestivum* L.). *South African Journal of Botany* 73(1): 35-39.

de Wet L (2005). Is *Pelargonium reniforme* in danger? The effects of harvesting on *Pelargonium reniforme*. *Veld & Flora*. December: 182-184.

7 Appendix B: CWAC datasheets

	<h1 style="margin: 0;">CWAC</h1> <h2 style="margin: 0;">COORDINATED WATERBIRD COUNTS</h2> <p style="margin: 0;">(CWAC forms part of Wetland International's African Waterbird Census Programme)</p>	
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SITE DATA COLLECTION FORM

Please return this form to: CWAC, Animal Demography Unit, University of Cape Town, Rondebosch, 7701. Or email to cwac@adu.org.za. For assistance with filling in the form, please refer to CWAC Information Sheet number 8

NAME OF SITE:		SITE CODE:	
Degrees-minutes-seconds or Decimal degrees or Deg. & decimal minutes GPS setting S <input type="text"/> <input type="text"/> <input type="text"/> ° <input type="text"/> <input type="text"/> ' <input type="text"/> <input type="text"/> " S <input type="text"/> <input type="text"/> <input type="text"/> <input type="text"/> <input type="text"/> <input type="text"/> ° S <input type="text"/> <input type="text"/> ° <input type="text"/> <input type="text"/> ' <input type="text"/> <input type="text"/> " Cape datum Clarke 1880 <input type="checkbox"/>		E 0 <input type="text"/> <input type="text"/> <input type="text"/> ° <input type="text"/> <input type="text"/> ' <input type="text"/> <input type="text"/> " E 0 <input type="text"/> <input type="text"/> <input type="text"/> <input type="text"/> <input type="text"/> <input type="text"/> ° E 0 <input type="text"/> <input type="text"/> ° <input type="text"/> <input type="text"/> ' <input type="text"/> <input type="text"/> " WGS-84 datum HBH94 <input type="checkbox"/>	
PROVINCE (<u>underline applicable option</u>) LP MP GP NW FS KN EC NC WC		DATE OF SURVEY: ADU OBSERVER CODE:	
NEAREST TOWN:		COMPILERS DETAILS (name, address, telephone, email etc.):	
CONSERVATION MEASURES SURROUNDING THE SITE / WETLAND (<u>underline applicable option</u>) Conservation status: 1 – Protected 2 – Partially protected 3 – Unprotected 4 - Unknown Site / Management status (<u>underline applicable option or add additional</u>)			
<ul style="list-style-type: none"> • Part of a National Park • Part of a Provincial Reserve • Part of a Local / Municipal Reserve • Part of a Private Reserve • Registered Conservancy 		<ul style="list-style-type: none"> • Private Land • State Land • Municipal Land • Mining Property 	
Name of protected area / farm / private land etc: Current land use surrounding site (e.g. agriculture, grazing, hunting, urban – indicate dominant type): Ownership / Management of site (name, email and telephone number): Is it a Ramsar site (name): Is it within an Important Bird Area (name):			
WETLAND / SITE CLASSIFICATION (<u>underline the relevant options and indicate the % make-up of each</u>)			
Wetland classification	(%)	Wetland classification	(%)
Marine / Coastal Wetlands		Seasonal rivers / streams (inc. waterfalls)	
Permanent shallow marine waters (<8m at low tide)		Permanent freshwater lakes (>8ha) (inc. oxbow lakes)	
Rocky marine shores (inc. cliffs and offshore islands)		Seasonal freshwater lakes (>8ha) (inc. floodplain lakes)	
Sandy or pebble shores (inc. sand banks and dunes)		Permanent freshwater marshes (<8ha) (inc. swamps)	
Estuarine waters (permanent water of est. systems)		Seasonal freshwater marshes (<8ha) (inc. vleis)	
River mouth		Permanent brackish / saline / alkaline lakes	
Intertidal mud, sand or salt flats		Seasonal brackish / saline / alkaline lakes (inc. flats)	
Intertidal marshes (inc. salt, brackish and freshwater)		Permanent brackish / saline marshes (inc. pans and pools)	
Intertidal forested wetlands (inc. mangrove swamps)		Seasonal brackish / saline marshes (inc. pans and pools)	
Coastal brackish / saline lagoons		Freshwater shrub-dominated wetland	
Coastal freshwater lagoons		Freshwater tree-dominated wetland (inc. swamp forest)	
Inland Wetlands		Freshwater springs and oases	
Permanent rivers / streams (inc. waterfalls)			

Wetland classification	(%)	Wetland classification	(%)
Artificial Wetlands		Salt mining sites (inc. pans and evaporation dams)	
Aquaculture ponds		Wastewater treatment areas	
Farm dams (generally <8ha)		Water storage areas (impoundments generally >8ha)	
Irrigated agricultural fields		Excavations (inc. quarries, pits and mining dams)	
Seasonally flooded agricultural land		Canals and drainage channels (inc. ditches)	

If this particular count section forms part of a greater wetland system, please indicate the appropriate wetland classification that would best describe the wetland as a whole (choose from the list above and indicate it here):

HABITAT / WETLAND COMPOSITION (indicate % coverage and underline applicable options or include additional)

Vegetation level	% Coverage	Species / Structure if known				
Submerged vegetation		Pond weed	Sedges	Kelp		
Floating vegetation		Water lilies	Water hyacinth	Kariba weed	Red water fern	Parrot's feather
		Water lettuce	Watercress	Algae	Kelp	
Emergent vegetation (immediate vicinity of wetland <50m)		Common reed	Typha	Palmiet	Sedges	Restios
		Grasses	Shrubs	Trees		
Surrounding vegetation (greater area surrounding wetland >50m)		Grasses	Shrubs	Trees	Fynbos	Grassland
		Karoo	Savanna	Bushveld	Thicket	Forest

Dominant substrate type	Bedrock	Boulders	Cobbles	Gravel	Sand
		Mud	Clay	Detritus	Peat

Acidity	Neutral (pH 6 – 8)			Alkaline (pH >8)	
	Acid (pH <6)				

Salinity	Fresh (<0‰)	Brak (0 to <3 ‰)	Saline (3 to <20 ‰)	Hyper saline (>20 ‰)

Approximate size	<1 ha	1 – 10 ha	10 – 20 ha	20 – 100 ha	>100 ha

Approximate maximum depth	0 – 0.5m	0.5 – 1m	1 – 2m	>2m





Site / wetland context	Single, discrete wetland	Part of a mosaic of wetlands

App. length / width in case of a river	Length (km) =	Width (m) =

THREATENING FACTORS (underline the applicable options or include additional. Please also indicate the severity level of the threat by indicating either with 1 = Mild, 2 = Important, 3 = Severe and 4 = Critical)

Threatening Factor	Sev. Level	Threatening Factor	Sev. Level
Sedimentation		Wetland reclamation / infilling	
Eutrophication		Wetland modification / alteration	
Erosion		Infrastructure development (e.g. roads and bridges)	
Floating alien vegetation		Water abstraction	
Emergent alien vegetation		Dam / barrage / weir construction	
Surrounding alien vegetation		Tourism / recreation	
Reed encroachment		Residential / urban development	
Alien animals – fish		Industrial and associated development	
Alien animals – birds		Mining and associated development	
Cutting / Clearing surrounding vegetation		Informal settlement encroachment	
Over harvesting of surrounding vegetation		Power lines	
Agriculture – crops		Fire / burning	
Agriculture – irrigation		Pollution by domestic sewage	
Agriculture – livestock		Pollution by solid waste (inc. dumping and litter)	
Nature conservation – excessive game numbers		Pollution by fertilizers and pesticides	
Afforestation		Pollution by oils (inc. fuels)	
Hunting		Pollution as a result of mining activities	
Trapping / Poaching		Pollution as a result of mining activities	
Aquaculture			
Fishing operations (including subsistence)			

BRIEF DESCRIPTION OF THE SITE (in a textual format, please describe the site to the best of your ability in terms of all the above factors – location, conservation status, classification, habitat composition and threats):

	<h2 style="margin: 0;">CWAC Census Form Ver 5.1</h2> <h3 style="margin: 0;">Animal Demography Unit</h3>	
		

Please return this form to: CWAC, Animal Demography Unit, University of Cape Town, Rondebosch, 7701. Alternatively, email this form back to cwac@adu.org.za before the end of March (for summer survey) or August (for winter survey)

Name of site:	Site code:	
Date of survey (dd/mm/yyyy):	Starting time:	Finishing time:
Name of compiler:	ADU observer code:	
Season (summer = 15 Jan – 15 Feb, winter = 1 July – 31 July, other = any additional count, circle or underline) 1 – Summer 2 – Winter 3 – Other		
New contact details (please indicate any new details, otherwise leave blank)		
Names of additional observers (initials and surname e.g. M. Wheeler)		
Has this site been counted for CWAC before (circle or underline) 1 – Yes 2 – No	Type of count (circle or underline) 1 – on foot 2 – by boat 3 – aerial 4 – motor vehicle 5 – mixed	Count conditions (circle or underline) 1 – bad 2 – poor 3 – moderate 4 – good 5 – ideal
Condition of wetland (circle or underline) 1 – full (high tide for estuaries) 2 – partially full (mid tide for estuaries) 3 – very little standing water (low tide for estuaries) 4 – mud only 5 – dry	Percentage of wetland area covered by count (to nearest 5%) % of shoreline: % of open water:	
Fixed-point photography (circle or underline and submit your digital photographs with the count) 1 – Yes 2 – No		
Comments (include any factors that might have affected the results, e.g. rain, wind, water level, disturbance, etc.)		
OFFICE USE ONLY		
CARD <input type="text"/> <input type="text"/> <input type="text"/> <input type="text"/> <input type="text"/> <input type="text"/>	<input checked="" type="checkbox"/>	CENTER POINT <input type="text"/> <input type="text"/> <input type="text"/> <input type="text"/> <input type="text"/> <input type="text"/> <input type="text"/> <input type="text"/>
DATE <input type="text"/> <input type="text"/> <input type="text"/> <input type="text"/> <input type="text"/> <input type="text"/>	TIME <input type="text"/> <input type="text"/> <input type="text"/> <input type="text"/> <input type="text"/> <input type="text"/>	COMP. <input type="text"/> <input type="text"/> <input type="text"/> <input type="text"/> <input type="text"/> <input type="text"/>
BEFORE <input type="text"/>	COND. WETLAND <input type="text"/>	COND. COUNT <input type="text"/>
ADD. INFO <input type="text"/>	TOTAL <input type="text"/> <input type="text"/> <input type="text"/> <input type="text"/> <input type="text"/> <input type="text"/>	SEASON <input type="text"/>

8 Appendix C: Expected Bird List: CWAC (1993 to 2012)

Family	Scientific name	Common name	TOPs	KZN	RL
Accipitridae	<i>Haliaeetus vocifer</i>	Fish-eagle, African			
	<i>Circus ranivorus</i>	Marsh-harrier, African	PR		EN
	<i>Gypohierax angolensis</i>	Vulture, Palm-nut			
Alcedinidae	<i>Megaceryle maximus</i>	Kingfisher, Giant			
	<i>Alcedo cristata</i>	Kingfisher, Malachite			
	<i>Halcyon senegaloides</i>	Kingfisher, Mangrove			EN
	<i>Ceryle rudis</i>	Kingfisher, Pied			
Anatidae	<i>Sarkidiornis melanotos</i>	Duck, Knob-billed		Sch2	
	<i>Thalassornis leuconotus</i>	Duck, White-backed		Sch2	
	<i>Dendrocygna viduata</i>	Duck, White-faced		Sch1	
	<i>Anas undulata</i>	Duck, Yellow-billed		Sch1	
	<i>Alopochen aegyptiacus</i>	Goose, Egyptian		Sch1	
	<i>Plectropterus gambensis</i>	Goose, Spur-winged		Sch1	
	<i>Netta erythrophthalma</i>	Pochard, Southern		Sch2	
	<i>Nettapus auritus</i>	Pygmy-Goose, African			
	<i>Anas smithii</i>	Shoveler, Cape		Sch2	
	<i>Anas capensis</i>	Teal, Cape			
	<i>Anas hottentota</i>	Teal, Hottentot		Sch1	
	<i>Anas erythrorhyncha</i>	Teal, Red-billed		Sch1	
Anhingidae	<i>Anhinga rufa</i>	Darter, African			
Ardeidae	<i>Bubulcus ibis</i>	Egret, Cattle			
	<i>Egretta alba</i>	Egret, Great			
	<i>Egretta garzetta</i>	Egret, Little			
	<i>Egretta intermedia</i>	Egret, Yellow-billed			
	<i>Ardea melanocephala</i>	Heron, Black-headed			
	<i>Ardea goliath</i>	Heron, Goliath			
	<i>Butorides striata</i>	Heron, Green-backed			
	<i>Ardea cinerea</i>	Heron, Grey			
	<i>Ardea purpurea</i>	Heron, Purple			
	<i>Ardeola ralloides</i>	Heron, Squacco			
Burhinidae	<i>Burhinus vermiculatus</i>	Thick-knee, Water			
Charadriidae	<i>Vanellus armatus</i>	Lapwing, Blacksmith			
	<i>Charadrius pallidus</i>	Plover, Chestnut-banded			NT
	<i>Charadrius hiaticula</i>	Plover, Common Ringed			

Family	Scientific name	Common name	TOPs	KZN	RL
	<i>Charadrius leschenaultii</i>	Plover, Greater Sand			
	<i>Pluvialis squatarola</i>	Plover, Grey			
	<i>Charadrius pecuarius</i>	Plover, Kittlitz's			
	<i>Charadrius mongolus</i>	Plover, Lesser Sand			
	<i>Charadrius tricollaris</i>	Plover, Three-banded			
	<i>Charadrius marginatus</i>	Plover, White-fronted			
Ciconiidae	<i>Anastomus lamelligerus</i>	Openbill, African			
	<i>Ciconia episcopus</i>	Stork, Woolly-necked			
	<i>Mycteria ibis</i>	Stork, Yellow-billed		Sch9	EN
Dromadidae	<i>Dromas ardeola</i>	Plover, Crab			
Glareolidae	<i>Glareola pratincola</i>	Pratincole, Collared			
Gruidae	<i>Balearica regulorum</i>	Crane, Grey Crowned	EN	Sch9	EN
Hirundinidae	<i>Riparia paludicola</i>	Martin, Brown-throated			
Jacaniidae	<i>Actophilornis africanus</i>	Jacana, African			
	<i>Microparra capensis</i>	Jacana, Lesser			NT
Laridae	<i>Larus cirrocephalus</i>	Gull, Grey-headed			
	<i>Larus dominicanus</i>	Gull, Kelp			
	<i>Larus fuscus</i>	Gull, Lesser Black-backed			
	<i>Sterna caspia</i>	Tern, Caspian			VU
	<i>Sterna hirundo</i>	Tern, Common			
	<i>Sterna bengalensis</i>	Tern, Lesser Crested			
	<i>Sterna albifrons</i>	Tern, Little			
	<i>Sterna sandvicensis</i>	Tern, Sandwich			
	<i>Sterna bergii</i>	Tern, Swift			
	<i>Chlidonias hybrida</i>	Tern, Whiskered			
Motacillidae	<i>Chlidonias leucopterus</i>	Tern, White-winged			
	<i>Motacilla aguimp</i>	Wagtail, African Pied			
	<i>Motacilla capensis</i>	Wagtail, Cape			
Pandionidae	<i>Pandion haliaetus</i>	Osprey, Osprey		Sch9	
Pelecanidae	<i>Pelecanus onocrotalus</i>	Pelican, Great White			VU
	<i>Pelecanus rufescens</i>	Pelican, Pink-backed	EN	Sch9	VU
Phalacrocoracidae	<i>Phalacrocorax capensis</i>	Cormorant, Cape			EN
	<i>Phalacrocorax africanus</i>	Cormorant, Reed			
	<i>Phalacrocorax lucidus</i>	Cormorant, White-breasted			
Phoenicopteridae	<i>Phoenicopterus ruber</i>	Flamingo, Greater		Sch9	NT
	<i>Phoenicopterus minor</i>	Flamingo, Lesser		Sch9	NT

Family	Scientific name	Common name	TOPs	KZN	RL
Podicipedidae	<i>Tachybaptus ruficollis</i>	Grebe, Little			
Rallidae	<i>Fulica cristata</i>	Coot, Red-knobbed		Sch8	
	<i>Zapornia flavirostris</i>	Crake, Black			
	<i>Porphyrio martinicus</i>	Gallinule, American Purple			
	<i>Gallinula chloropus</i>	Moorhen, Common			
	<i>Rallus caerulescens</i>	Rail, African			
	<i>Porphyrio madagascariensis</i>	Swamphen, African Purple			
Recurvirostridae	<i>Himantopus himantopus</i>	Stilt, Black-winged			
Sarothruridae	<i>Sarothrura rufa</i>	Flufftail, Red-chested			
Scolopacidae	<i>Numenius arquata</i>	Curlew, Eurasian			NT
	<i>Limosa lapponica</i>	Godwit, Bar-tailed			
	<i>Tringa nebularia</i>	Greenshank, Common			
	<i>Calidris canutus</i>	Knot, Red			
	<i>Tringa totanus</i>	Redshank, Common			
	<i>Philomachus pugnax</i>	Ruff, Ruff			
	<i>Calidris alba</i>	Sanderling, Sanderling			
	<i>Limicola falcinellus</i>	Sandpiper, Broad-billed			
	<i>Actitis hypoleucos</i>	Sandpiper, Common			
	<i>Calidris ferruginea</i>	Sandpiper, Curlew			
	<i>Tringa stagnatilis</i>	Sandpiper, Marsh			
	<i>Xenus cinereus</i>	Sandpiper, Terek			
	<i>Tringa glareola</i>	Sandpiper, Wood			
	<i>Calidris minuta</i>	Stint, Little			
	<i>Arenaria interpres</i>	Turnstone, Ruddy			
<i>Numenius phaeopus</i>	Whimbrel, Common				
Scopidae	<i>Scopus umbretta</i>	Hamerkop, Hamerkop			
Stercorariidae	<i>Catharacta antarctica</i>	Skua, Subantarctic			EN
Threskiornithidae	<i>Threskiornis aethiopicus</i>	Ibis, African Sacred			
	<i>Plegadis falcinellus</i>	Ibis, Glossy			
	<i>Bostrychia hagedash</i>	Ibis, Hageda			
	<i>Platalea alba</i>	Spoonbill, African			

9 Appendix D: Data Example

Bird point	Start time	End time	Habitat	Common name	Scientific name	Number	ID	Direction	Identification notes
LOW TIDE									
BS01									
BS02									
BS03									
BS04									
BS05									
BS06									
BS07									
BS08									

BS09									
HIGH TIDE									
BS10									
BS11									
BS12									
BS13									



environmental affairs

Department:
Environmental Affairs
REPUBLIC OF SOUTH AFRICA

DETAILS OF THE SPECIALIST, DECLARATION OF INTEREST AND UNDERTAKING UNDER OATH

	(For official use only)
File Reference Number:	
NEAS Reference Number:	DEA/EIA/14/12/16/3/3/2007
Date Received:	02 November 2020

Application for authorisation in terms of the National Environmental Management Act, Act No. 107 of 1998, as amended and the Environmental Impact Assessment (EIA) Regulations, 2014, as amended (the Regulations)

PROJECT TITLE

The Proposed Gas to Power Powerhip Project at the Port of Richards Bay, Umhlatuze Local Municipality, King Cetshwayo District, Kwazulu-Natal.

Kindly note the following:

1. This form must always be used for applications that must be subjected to Basic Assessment or Scoping & Environmental Impact Reporting where this Department is the Competent Authority.
2. This form is current as of 01 September 2018. It is the responsibility of the Applicant / Environmental Assessment Practitioner (EAP) to ascertain whether subsequent versions of the form have been published or produced by the Competent Authority. The latest available Departmental templates are available at <https://www.environment.gov.za/documents/forms>.
3. A copy of this form containing original signatures must be appended to all Draft and Final Reports submitted to the department for consideration.
4. All documentation delivered to the physical address contained in this form must be delivered during the official Departmental Officer Hours which is visible on the Departmental gate.
5. All EIA related documents (includes application forms, reports or any EIA related submissions) that are faxed; emailed; delivered to Security or placed in the Departmental Tender Box will not be accepted, only hardcopy submissions are accepted.

Departmental Details

Postal address:

Department of Environmental Affairs
Attention: Chief Director: Integrated Environmental Authorisations
Private Bag X447
Pretoria
0001

Physical address:

Department of Environmental Affairs
Attention: Chief Director: Integrated Environmental Authorisations
Environment House
473 Steve Biko Road
Arcadia

Queries must be directed to the Directorate: Coordination, Strategic Planning and Support at:
Email: EIAAdmin@environment.gov.za

1. SPECIALIST INFORMATION

Specialist Company Name:	Anchor Environmental Consultants (Pty) Ltd		
B-BBEE	Contribution level (indicate 1 to 8 or non-compliant)	Non-compliant	Percentage Procurement recognition
Specialist name:	Barry Clark		
Specialist Qualifications:	Ph D Marine Ecology		
Professional affiliation/registration:	SACNASP 400021/05		
Physical address:	8 Steenberg House, Silverwood Close, Tokai		
Postal address:	8 Steenberg House, Silverwood Close, Tokai		
Postal code:	7945	Cell:	0823730521
Telephone:	021 7013420	Fax:	
E-mail:	Barry @anchorenvironmental.co.za		

2. DECLARATION BY THE SPECIALIST

I, Barry Clark; declare that –

- I act as the independent specialist in this application;
- I will perform the work relating to the application in an objective manner, even if this results in views and findings that are not favourable to the applicant;
- I declare that there are no circumstances that may compromise my objectivity in performing such work;
- I have expertise in conducting the specialist report relevant to this application, including knowledge of the Act, Regulations and any guidelines that have relevance to the proposed activity;
- I will comply with the Act, Regulations and all other applicable legislation;
- I have no, and will not engage in, conflicting interests in the undertaking of the activity;
- I undertake to disclose to the applicant and the competent authority all material information in my possession that reasonably has or may have the potential of influencing - any decision to be taken with respect to the application by the competent authority; and - the objectivity of any report, plan or document to be prepared by myself for submission to the competent authority;
- all the particulars furnished by me in this form are true and correct; and
- I realise that a false declaration is an offence in terms of regulation 48 and is punishable in terms of section 24F of the Act.



Signature of the Specialist

Anchor Environmental Consultants (Pty) Ltd

Name of Company:

2 November 2022

Date

Details of Specialist, Declaration and Undertaking Under Oath

3. UNDERTAKING UNDER OATH/ AFFIRMATION

I, Barry Clark, swear under oath / affirm that all the information submitted or to be submitted for the purposes of this application is true and correct.



Signature of the Specialist

Anchor Environmental Consultants (Pty) Ltd

Name of Company

2 November 2022

Date



Signature of the Commissioner of Oaths

4.10.2022

Date

Janine van Graan
Commissioner of Oaths
Professional Accountant (SA)
SAIPA Membership No. 7380
Minter House, 1 Otto Close
Westlake, 7945