



**EIA FOR THE PROPOSED BRANDVALLEY WIND ENERGY FACILITY,
NORTHERN AND WESTERN CAPE PROVINCES, SOUTH AFRICA.**

DEA Reference Number: 14/12/16/3/3/2/900

DENC Reference Number: NC/NAT/ZFM/KHE/BLA1/2016

ENVIRONMENTAL SCOPING REPORT


FINAL

<p>Prepared for:</p>  <p>Brandvalley Wind Farm (Pty) Ltd</p>	<p>Prepared by:</p>  <p>EOH Coastal & Environmental Services</p>
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03 March 2016

REVISIONS TRACKING TABLE

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UPDATE FROM DRAFT TO FINAL SCOPING

The Environmental Impact Assessment (EIA) process for the proposed Brandvalley Wind Farm has been undertaken in accordance with the 2014 EIA Regulations. The Scoping Phase of the EIA defined the Plan of Study for the EIA Phase. The release of a Draft Scoping Report provided stakeholders with an opportunity to submit comments and or concerns on the scoping assessment for a 30-day period from 25 January 2016 until 23 February 2016. This Final Scoping Report incorporated all issues and responses received on the Draft Scoping Report.

For ease of reference, substantial changes made from the Draft Report to this Final version have been underlined.

DETAILS OF EAP AND PROJECT TEAM

Mr Marc Hardy

(Role: Environmental Assessment Practitioner, Project Leader/Reviewer)

Marc holds a M.Phil in Environmental Management from Stellenbosch University's School of Public Management and Planning. His professional interests include environmental impact reporting for linear, energy and bulk infrastructure projects, strategic environmental policy development and reporting – mostly relating to Environmental Management Frameworks (EMFs) - compliance monitoring and environmental auditing. Marc has, amongst others, been project manager for the Dinokeng EMF (Gauteng), the Milnerton Refinery to Ankerlig Power Station Liquid Fuels Transportation Infrastructure Project, numerous Eskom Transmission and Distribution power line and substation EIAs countrywide, mining EMPR compliance audits, compliance audits for Camden, Grootvlei and Komati Power Stations and the hazardous waste management facility for the Coega Development Corporation (Coega IDZ). Before entering the consulting field he gained extensive experience in the EIA regulatory field whilst in the employ of the Gauteng Department of Agriculture, Conservation and Environment - being responsible for the review of infrastructure projects like the Gautrain Rapid Rail system and representing the Department on various EMF project steering committees. He is currently managing numerous EIA processes for wind energy developments countrywide, as well as renewable energy and mining projects throughout Africa.

Ms Amber Jackson

(Role: Project Manager and Report Production)

Amber, Senior Environmental Consultant at CES, has an MPhil in Environmental Management and has a background in both Social and Ecological work. Her undergraduate degrees focused on Ecology, Conservation and Environment with particular reference to landscape effects on Herpetofauna, while her masters focused on the environmental management of social and ecological systems. With a dissertation in food security that investigated the complex food system of informal and formal distribution markets. She has been involved in managing the Environmental and Social Impact Assessment for two large forestry plantation projects in Mozambique (Green Resources) and numerous wind farm applications in South Africa. During her time at CES she has co-ordinated specialist studies, put together the Impact Reports, prepared the Issues and Response trails and managed the compilation of the Social and Environmental Management Programmes and Monitoring Programmes. She has been involved in ecological studies in Mozambique and South Africa. Interests include, ecological studies dealing with indigenous fauna and flora, as well as land use and natural resource management. She is registered as a candidate Professional Natural Scientist in the field of Environmental Science through the South African Council for Natural Scientific Professions (SACNASP).

Ms Belinda Huddy

(Role: Public Participation Process and Report Production)

Belinda, Environmental Consultant at CES, holds an MPhil in Environment, Society and Sustainability and a Bachelor of Business Science (Hons) in Economics both obtained from the University of Cape Town. Her master's dissertation explored alternative values, focusing on the social values, attached to the Cape Town Talent Exchange. Her honours thesis investigated the determinants of the success and failures of the bio-diesel industry, focusing on a jatropha plantation in Zambia. Courses in her master's degree include Theory and Practice of Environment Management, Managing Complex Human-Ecological Systems, Environmental Law and Cultural Geography. The relevant courses in her honours degree included Environmental Economics and Natural Resource Economics.

PROPOSED PROJECT TEAM

EOH Coastal & Environmental Services team and responsibilities

<i>Mr Marc Hardy</i>	Environmental Assessment Practitioner and Project Leader
<i>Ms Amber Jackson</i>	Project Manager
<i>Ms Belinda Huddy</i>	Project Manager & Author

Sub-consultant team members and responsibilities

Specialist field	Specialist		Peer review required by DEA
Archaeological Impact Assessment	Ms Celeste Booth	Booth Heritage Consulting (Pty) Ltd	No
Agricultural Impact Assessment	Mr Roy de Kock	EOH CES	Yes
Aquatic Impact Assessment	Dr Brian Colloty	Scherman Colloty & Associates (SC&A)	No
Avifaunal Impact Assessment	Dr Tony Williams	African Insights	No
Bat Impact Assessment	Mr Werner Marais	Animalia Zoological & Ecological Consultation CC	No
Ecological Impact Assessment	Mr Simon Todd	Independent Ecological Consultant	No
Heritage Screeners	Mr Nicholas Wiltshire	Cedar Tower Services	No
Heritage Impact Assessment	Ms Celeste Booth	Booth Heritage Consulting (Pty) Ltd	No
Noise Impact Assessment	Dr Brett Williams	Safetech	No
Socio-Economic Impact Assessment	Mr Tony Barbour	Independent Consultant	No
Visual Assessment Specialist	Mr Thomas King	EOH CES	Yes

DOCUMENT CHECKLIST

Overview of Public Participation Process requirements in terms of Section 41(2), (3), (4), Section 42 and Section 44(1) of the Government Notice (GN) R.982 and where the relevant information can be found in this Report.

Item in GN R.982	Requirement Description	Relevant Section
41 (2)	give notice to all potential interested and affected parties by:	
41 (2) (a)	fixing a notice board at a place conspicuous to and accessibly by the public at the boundary or on the fence or along the corridor of— (i) the site where the activity to which the application or proposed application relates is or is to be undertaken; and (ii) any alternative site; proof of site notice must be included	Refer to Appendix C-5
41 (2) (b)	giving written notice, in any of the manners provided for in section 47D of the Act, to (these are considered as key stakeholders)— (i) the occupiers of the site and, if the proponent or applicant is not the owner or person in control of the site where the activity is to be undertaken, the owner or person in control of the site where the activity is or is to be undertaken or to any alternative site where the activity is to be undertaken; (ii) owners, persons in control of, and occupiers of land adjacent to the site where the activity is or is to be undertaken or to any alternative site where the activity is to be undertaken; (iii) the municipal councillor of the ward in which the site is situated or alternative site is situated and any organisation of ratepayers that represent the community in the area; (iv) the municipality which has jurisdiction in the area; (v) any organ of state having jurisdiction in respect of any aspect of the activity; and (vi) any other party as required by the competent authority;	Refer to Appendix C-3 and C-2 for the I&AP database
41 (2) (c)	placing an advertisement in: (i) one local newspaper; or (ii) any official Gazette that is published specifically for the purpose of providing public notice of applications or other submissions made in terms of these regulations; (scans and copy the entire page where the advert appears)	Refer to Appendix C-4
41(2) (d)	Placing an advertisement in at least one provincial newspaper or national newspaper, if the activity has or may have an impact that extends beyond the boundaries of the metropolitan or district municipality in which it is or will be undertaken.	Refer to Appendix C-4
41 (3) (a) (b)	The notice, notice board or advertisement referred to in sub regulation (2) must – give details of the application or proposed application which is subject to public participation; and state - (i) whether basic assessment of S&REIR procedures are being applied to the application; (ii) the nature and location of the activity to which the application relates; (iii) where further information on the application or proposed application can be obtained; and (iv) the manner in which and the person to whom representations in respect of the application or proposed application may be made	Refer to Appendix C-4 and C-5
41 (4) (a) (b)	A notice board referred to in sub regulation (2) must - (a) be of a size at least 60cm by 42cm; and display the required information in lettering and in a format as may be determined by the competent authority.	
42 (a-c)	A proponent or applicant must ensure the opening and maintenance of a register of interested and affected parties and submit such a register to the competent authority, which register must contains the names, contact details and addresses of— (a) all persons who, as a consequence of the public participation process conducted in respect of that application, have submitted written comments or attended meetings with the proponent, applicant or EAP; (b) all persons who, have requested the proponent or applicant, in writing, for their names to be placed on the register; and (c) all organs of state which have jurisdiction in respect of the activity to which the application relates.	Refer to Appendix C-2
44 (1)	The applicant must ensure that the comments of interested and affected parties are recorded in reports and plans and that such written comments, including responses to such comments and records of meetings, are attached to the reports and plans that are submitted to the competent authority in terms of these Regulations.	Refer to Chapter 8, Section 8.5 and Appendix C-6

Requirements for the Scoping Report in terms of Appendix 2 of GN R. 982 and where the relevant information can be found within this Report.

Item in GN R.982 (Appendix 2)	Requirement	Relevant Chapter/Section
2	A Scoping Report must contain the information that is necessary for a proper understanding of the process, informing all preferred alternatives, including location alternatives, the scope of the assessment, and the consultation process to be undertaken through the EIA process, including	
(a) Details of -	EAP (i) the EAP who prepared the report; and (ii) the expertise of EAP, including curriculum vitae;	Refer to Chapter 1, Section 1.6 and Appendix D
(b) The location of the activity, including –	Project (i) the Surveyor General code of each cadastral land parcel; (ii) where available, the physical address and farm name; (ii) where the required information in items (i) and (ii) is not available, the coordinates of the boundary of the property or properties;	Refer to Chapter 2, Section 2.1, Table 2-1
(c) A plan which locates the proposed activity or activities applied for at an appropriate scale, or, if it is –	(i) a linear activity, a description and coordinates of the corridor in which the proposed activity or activities is to be undertaken; or (ii) on land where the property has not been defined, the coordinates within which the activity is to be undertaken;	Refer to Chapter 2, Section 2.2.3
(d) A description of the scope of the proposed activity, including -	(i) all listed and specified activities triggered; (ii) a description of the activities to be undertaken, including associated structures and infrastructure;	Refer to Chapter 1, Section 1.3, Table 1-1 and Chapter 2, Section 2.2
(e)	A description of the policy and legislative context within which the development is proposed including the identification of all legislation, policies, guidelines, spatial tools, municipal development planning frameworks and instruments that are applicable to this activity and are to be considered in the assessment process;	Refer to Chapter 5
(f)	A motivation for the need and desirability for the proposed development including the need and desirability of the activity in the context of the preferred location;	Refer to Chapter 4
(h) A full description of the process followed to reach the proposed preferred activity, site and location within the site, including –	(i) details of all alternatives considered; (ii) details of the public participation process undertaken in terms of regulation 41 of the Regulations, including copies of the supporting documents and inputs; (iii) a summary of the issues raised by interested and affected parties, and an indication of the manner in which the issues were incorporated, or the reasons for not including them; (iv) the environmental attributes associated with the alternatives focusing on the geographical, physical, biological, social, economic, heritage and cultural aspects; (v) the impacts and risks identified for each alternative, including the nature, significance, consequence, extent, duration and probability of the impacts, including the degree to which these impacts – (aa) can be reversed (bb) may cause irreplaceable loss of resources; (cc) can be avoided, managed or mitigated; (vi) the methodology used in determining and ranking the nature , significance, consequences, extent, duration and probability of potential environmental impacts and risks associated with the alternatives; (vii) positive and negative impacts that the proposed activity and alternatives will have on the environment and on the community that may be affected focusing on the geographic, physical, biological, social, economic, heritage and cultural aspects; (viii) the possible mitigation measures that could be applied and level of residual risk; (ix) the outcome of the site selection matrix; (x) if no alternatives, including the alternative locations for the activity were investigated, the motivation for not considering such and (xi) a concluding statement indication the preferred alternatives, including preferred location of the activity;	Refer to: (i) Chapter 3, Section 3.1, 3.2 , 3.3 and 3.4 (ii) Chapter 8 and Appendix C (iii) Chapter 8, Section 8.5 and Appendix C-6 (iv) Chapter 6 (v) Chapter 7 (vi) Chapter 7, Section 7.1 (vii) Chapter 7 (viii) Chapter 7 (ix) Chapter 3.5 (x) N/A (xi) Chapter 3.5
(i) A plan of study	(i) a description of the alternatives to be considered and assessed within	Refer to Chapter 9

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for undertaking the Environmental Impact Assessment process to be undertaken, including-	the preferred site, including the option of not proceeding with the activity; (ii) a description of the aspects to be assessed as part of the Environmental Impact Assessment process; (iii) aspects to be assessed by specialists; (iv) a description of the proposed method of assessing the environmental aspects, including aspects to be assessed by specialists; (v) a description of the proposed method of assessing duration and significance; (vi) an indication of the stages at which the competent authority will be consulted; (vii) a description of the public participation process that will be conducted during the Environmental Impact Assessment process; and (viii) identify suitable measures to avoid, reverse, mitigate or manage identified impacts and to determine the extent of the residual risk that need to be managed and monitored.	
(j) An undertaking of oath or confirmation by the EAP in relation to –	(i) the contents of the information provided in the report; (ii) the inclusion of comments and inputs from stakeholders and interested and affected parties; and (iii) any information provided by the EAP to interested and affected parties and any response by the EAP to comments or inputs made to interested and affected parties.	Refer to Appendix C-6 and Appendix E
(k)	an undertaking under oath or affirmation by the EAP in relation to the level of agreement between the EAP and interested and affected parties on the plan of study for undertaking the Environmental Impact Assessment;	Appendix E
(l)	where applicable, any specific information required by the competent authority; and	See table below
(m)	Any other matter required in terms of section 24(4)(a) and (b) of the Act.	The requirements of Section 24(a) and (b) will be met in the EIA Phase

DEA COMMENTS ON THE DRAFT SCOPING REPORT

The DEA provided comments on the Draft Scoping Report on 16 February 2016. For ease of reference, please see the table below for the relevant sections addressing the comments.

COMMENT	RELEVANT CHAPTER/ SECTION
i. <u>Please ensure that all relevant listed activities are applied for, are specific and that it can be linked to the development activity or infrastructure as described in the project description.</u>	<u>Please see Chapter 1, Section 1.3 as well as revision 1 of the application form.</u>
ii. <u>If activities applied for in the application differ from those mentioned in the final SR, 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.</u>	<u>An amended application form was submitted with updated listed activities (GN 983, Activity 9(i) and (ii) was removed). The application form template available on the DEA website was used.</u>
iii. <u>Please ensure that the application form is signed by the applicant and that a signed land owner's notification form is submitted to this Department.</u>	<u>The amended application was signed by the applicant. Signed consent forms from land owners were provided and are also provided in Appendix C-7.</u>
iv. <u>The Final SR must provide evidence that all identified and relevant competent authorities have been given an opportunity to comment on the proposed development; particularly the Square Kilometre Array South Africa, the South African Astronomical Observatory, the Department of Agriculture and the Department of Mineral Resources.</u>	<u>Please see Appendix C-2 and C-3.</u>
v. <u>The final SR must investigate and identify all traffic impact associated with the proposed development.</u>	<u>Please see Chapter 7.</u>
vi. <u>Should in-house specialists be used for any specialist study, then the specialist study must be peer reviewed by an external specialist.</u>	<u>Noted, the visual impact assessment and the agricultural impact assessment will be peer reviewed.</u>
vii. <u>The final Scoping Report must indicate all private and government nature protection areas in the area, including any Important Bird Areas.</u>	<u>Please see Chapter 6, Section 6.1.</u>
viii. <u>The final Scoping Report must indicate and describe the competing land uses in the area. This must further motivate the desirability of locating the wind energy facility at the preferred location.</u>	<u>Please see Chapter 4, Section 4.3.5 and Chapter 6, Section 6.1.3 and 6.1.4.</u>
ix. <u>Please ensure that all issues raised and comments received during the circulation of the SR from registered I&APs and organs of state which</u>	<u>Please see Chapter 8 for PPP details, Appendix C-6 for a copy of</u>

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	<p>have jurisdiction (including the Department's Biodiversity Section) in respect of the proposed activity are adequately addressed in the Final SR. Should you be unable to obtain comments, proof should be submitted to the Department of the attempts that were made to obtain comments. The Public Participation Process must be conducted in terms of the Regulation 39, 40, 41, 42, 43 & 44 of the EIA Regulations 2014.</p>	<p>the comments and responses report, I&AP database in C-2 and Appendix C3.3 and C3.6 for proof that attempts were made to obtain input from the various organs of state.</p>
<p>x. Please provide a description of any identified alternatives for the proposed activity that are feasible and reasonable, including the advantages and disadvantages that the proposed activity or alternatives will have on the environment and on the community that may be affected by the activity as per Appendix 2 of the EIA Regulations, 2014. Alternatively, you should submit written proof of an investigation and motivation if no reasonable or feasible alternatives exist in terms of Appendix 2.</p>		<p>Please see the description of alternatives in Chapter 3 and the advantages and disadvantages of the proposed project in Chapter 4.</p>
<p>xi. In accordance with Appendix 2 of the EIA Regulations 2014, the details of – i) the EAP who prepared the report; and xii. ii) the expertise of the EAP to carry out Scoping and Environmental Impact Assessment procedures must be submitted.</p>		<p>Refer to Chapter 1, Section 1.6 and Appendix D for CVs.</p>
<p>xiii. You are further reminded that the final SR to be submitted to this Department must comply with all requirements in terms of the scope of assessment and content of Scoping reports in accordance with Appendix 2 and Regulations 21(1) of the EIA Regulations, 2014.</p>		<p>Noted.</p>
<p>xiv. Further note that in terms of Regulation 45 of the EIA Regulations 2014, this application will lapse of the applicant fails to meet any of the timeframes prescribed in terms of these Regulations, unless an extension has been granted in terms of Regulation 3(7).</p>		<p>Noted.</p>

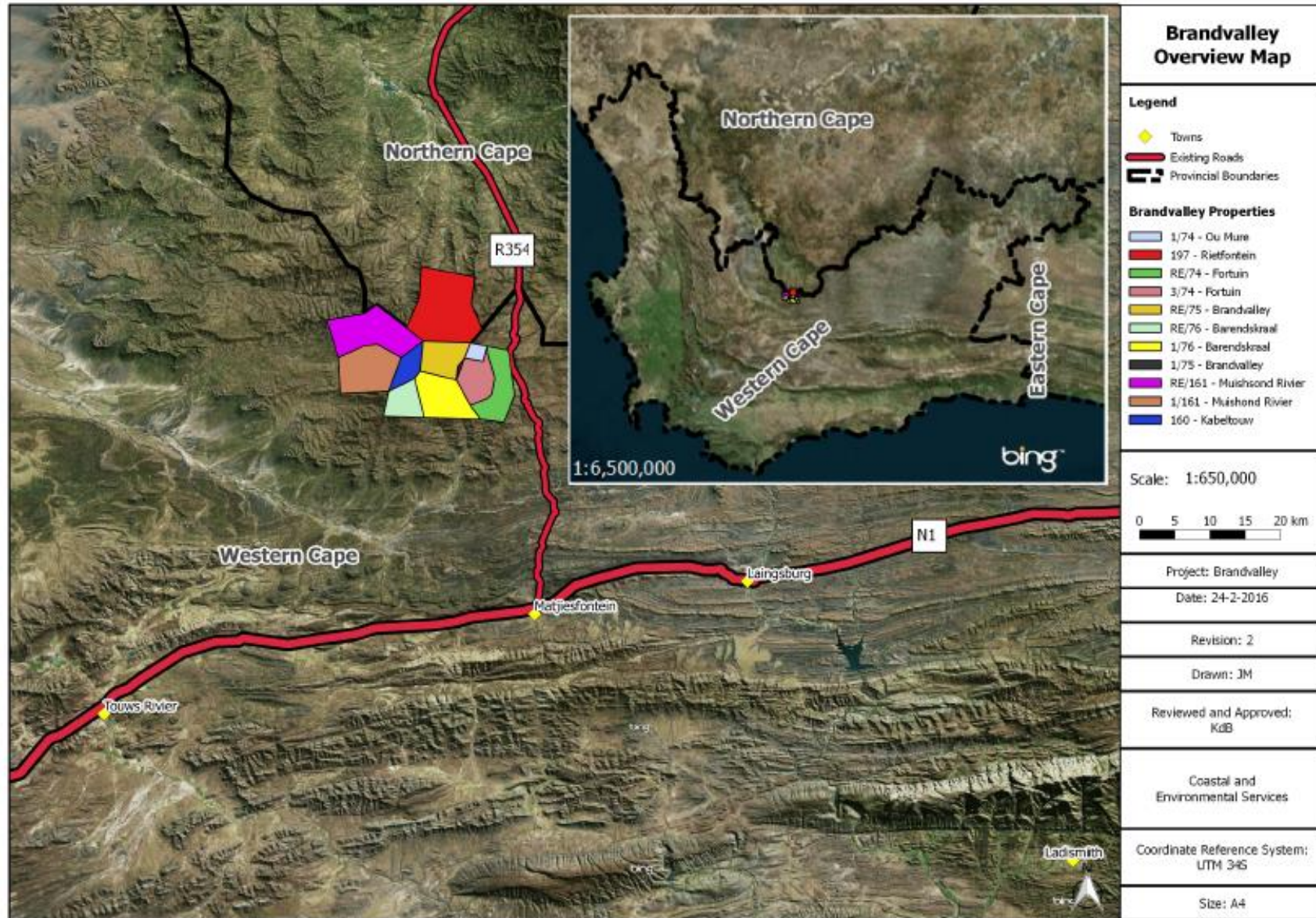
GENERAL SITE INFORMATION

Farm Portions on which the Proposed Development is Located.

Description of affected farm portions			
Farm Name and Number	21 digit SG Code	Municipality/ Province	Farm size (ha)
The Remainder of Barendskraal 76	C04300000000007600000	Laingsburg LM/ Central Karoo DM/ Western Cape	1,523.7
Portion 1 of Barendskraal 76	C04300000000007600001	Laingsburg LM / Central Karoo DM / Western Cape	2,828.6
The Remainder of Brandvalley 75	C04300000000007500000	Laingsburg LM / Central Karoo DM / Western Cape	1,981.9
Portion 1 of Brandvalley 75	C04300000000007500001	Laingsburg LM / Central Karoo DM / Western Cape	56.3
The Remainder of Fortuin 74	C04300000000007400000	Laingsburg LM / Central Karoo DM / Western Cape	2,454.98
Portion 3 Fortuin 74	C04300000000007400003	Laingsburg LM / Central Karoo DM / Western Cape	1,868.4
The Remainder of Kabeltouw 160	C019000000000016000000	Witzenberg (Ceres) LM/ Cape Winelands DM/ Western Cape	1,082.8
The Remainder of Muishond Rivier 161	C019000000000016100000	Witzenberg (Ceres) LM/ Cape Winelands DM/ Western Cape	4,051.8
Portion 1 of Muishond Rivier 161	C019000000000016100001	Witzenberg (Ceres) LM/ Cape Winelands DM/ Western Cape	3391
Portion 1 of Fortuin 74 (Ou Mure)	C04300000000007400001	Laingsburg LM / Central Karoo DM / Western Cape	408.9
The Farm Rietfontein 197	C072000000000019700000	Karoo Hoogland LM/ Namakwa DM/ Northern Cape	5,873.6
Total hectares			25,521.98

Details of the Proposed Wind Energy Facility.

Technical details of the proposed facility	
Generation capacity (at point of grid feed-in)	Maximum 140MW
Number of turbines	Approximately 70, between 1.5MW and 4MW in capacity each
Turbine foundation	25m in diameter and 4m in depth
Turbine hub height	Up to 120 m
Rotor Diameter	Up to 140 m
Laydown area (per turbine)	70m x 50m per turbine, total 24.5ha
Electrical turbine transformers	690V/33kV, footprint from 2m x 2m up to 10m x 10m.
Cabling	Underground 33kV cabling between turbines
Internal Access Roads	Up to 12m wide, including structures for storm-water control and turning circles would be required to access each turbine location. Where possible, existing roads will be upgraded.
Overhead power lines	33kV overhead power lines linking groups of wind turbines to onsite 33/132kV substation(s).
Onsite substation(s)	Potential 33/132kV onsite substation location(s) will be assessed.
Wind measuring lattice masts	4 x 120m, strategically placed within the wind farm development footprint to collect data on wind conditions during the operational phase.
Temporary Infrastructure	
Construction camp	~10ha
On-site concrete batching plant	~1ha
Borrow pits and quarries	~4.5ha
Fencing	~4m (height)



Locality Map indicating the position of the proposed project area relative to surrounding towns.

Site photographs of the Project Area.



Vegetation found in the project area.



General topography of the project area.



The R354 situated on the east of the project area, connects the N1 to the R356.

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LIST OF ABBREVIATIONS

ATNS	Air Traffic and Navigation Services
AU	Animal Unit
BA	Basic Assessment
BID	Background Information Document
CAPE	Cape Action for People and the Environment
CARA	Conservation of Agricultural Resources Act
CBA	Critical Biodiversity Area
CES	Coastal and Environmental Services
CFR	Cape Floristic Region
CSIR	Council for Scientific and Industrial Research
CST	Concentrated Solar Thermal
CVs	Curriculum Vitae
DAFF	Department of Agriculture, Forest and Fisheries
DBSA	Development Bank of South Africa
DEA	Department of Environmental Affairs
DEAT	Department of Environmental Affairs and Tourism
DENC	Department of Environmental and Nature Conservation
DM	District Municipality
DME	Department of Minerals and Energy
DoE	Department of Energy
DWA	Department of Water Affairs
DWS	Department of Water and Sanitation
EA	Environmental Authorisation
EAP	Environmental Assessment Practitioner
EBA	Endemic Bird Area
ECA	Environmental Conservation Act
EIA	Environmental Impact Assessment
EIR	Environmental Impact Report
EMFs	Environmental Management Framework
EMPr	Environmental Management Programme
ESA	Ecological Support Area
ESR	Environmental Scoping Report
EWT	Endangered Wildlife Trust
FEPA	Freshwater Ecosystem Priority Areas
GHG	Greenhouse gases
GIS	Geographical Information System
GNR	Government Notice Regulation
ha	Hectare
HIA	Heritage Impact Assessment
I&APs	Interested and Affected Parties
IBA	Important Bird Area
IDP	Integrated Development Plan
IEP	Integrated Energy Plan
IFC	International Finance Corporation
IPAP	Industrial Policy Action Plan
IPP	Independent Power Producer
IRP	Integrated Resource Plan
IUCN	International Union for Conservation of Nature
JV	Joint Venture

kV	Kilovolt
LM	Local Municipality
LSU	Large Stock Unit
Ltd	Limited
LTMS	Long Term Mitigation Scenarios
m/s	Meters per second
MAP	Mean Annual Precipitation
MAT	Mean Annual Temperature
MPRDA	Mineral and Petroleum Resources Development Act
MSA	Municipal Systems Act
MW	Megawatts
NBI	National Biodiversity Index
NDP	National Development Plan
NEM: AQA	National Environmental Management: Air Quality Act (Act No. 39 of 2004)
NEM: BA	National Environment Management: Biodiversity Act (Act 10 of 2004)
NEM: PAA	National Environmental Management: Protected Areas Act (Act No. 57 of 2003)
NEM: WMA	National Environmental Management: Waste Management Act (Act No. 59 of 2008)
NEMA	National Environmental Management Act (Act 107 of 1998) (as amended)
NERSA	National Energy Regulator of South Africa
NFEPA	National Freshwater Ecosystem Priority Areas
NPAES	National Protected Areas Expansion Strategy
NRTA	National Road Traffic Act
NT	National Treasury
NWA	National Water Act
NWI	National Wetlands Inventory
PICC	Presidential Infrastructure Coordinating Committee
PNCO	Provincial Nature Conservation Ordinance
PoS	Plan of Study
PPA	Power Purchase Agreement
PPP	Public Participation Process
PS	Performance Standards
QDS	Quarter Degree Squares
REFIT	Renewable Feed In Tariff
REIPPPP	Renewable Energy Independent Power Producer Procurement Programme
REPA	Renewable Energy Purchasing Agency
SA	Secondary Area
SAAO	South African Astronomical Observatory
SACCA	South African Civil Aviation Authority
SACNASP	South African Council for Natural Scientific Professions
SAHRA	South African Heritage Resources Agency
SAIAB	South African Institute for Aquatic Biodiversity
SALT	Southern African Large Telescope
SANBI	South African National Biodiversity Institute
SANParks	South African National Parks
SANRAL	South African National Roads Agency
SARCA	Southern African Reptile Conservation Assessment
SARi	South African Renewables Initiative
SAWS	South African Weather Services
SDF	Spatial Development Framework
SDP	Spatial Development Plan/ Site Development Plan

SGM	Shale Gas Mining
SIA	Social Impact Assessment
SIPS	Strategic Infrastructure Projects
SKA	Square Kilometre Array
SKEP	Succulent Karoo Ecosystem Programme
SSC	Species of Special Concern
STEP	Subtropical Thicket Ecosystem Project
TCP	Technical Cooperation Permit
ToR	Terms of Reference
UNFCCC	United Nations Framework Convention on Climate Change
WASA	Wind Atlas for South Africa
WEF	Wind Energy Facility
WESSA	Wildlife and Environmental Society of Southern Africa
WRC	Water Research Commission
WWF	Worldwide Fund for Nature

1. INTRODUCTION

According to Appendix 2(2) of the EIA Regulations (GN R. 982 of 2014), a *Scoping Report* must contain all the information necessary for a proper understanding of the process, informing all preferred alternatives, including location alternatives, the scope of the assessment, and the consultation process to be undertaken through the Environmental Impact Assessment process, and must include:

- (a) Details of –
 - (i) the EAP who prepared the report; and
 - (ii) the expertise of the EAP, including a Curriculum Vitae (CV)
- (d) a description of the scope of the proposed activity, including –
 - (i) all listed and specified activities triggered.

In accordance with the above requirements, Chapter 1 provides an overview of the proposed Brandvalley wind energy facility (WEF), the listed activities triggered and details of the Environmental Assessment Practitioner (EAP) undertaking the Scoping and Environmental Impact Assessment. Please see Appendix D for copies of the EAPs CVs.

1.1 Overview

Brandvalley Wind Farm (Pty) Ltd (the applicant), a subsidiary of G7 Renewable Energies (Pty) Ltd (G7), proposes to develop a 140 megawatt (MW) WEF near Laingsburg, on the border of the Northern Cape Province and the Western Cape Province in South Africa. The proposed WEF is located in the Karoo Hoogland, the Witzenberg (Ceres) and the Laingsburg Local Municipalities, which fall within the Namakwa, the Cape Winelands and the Central Karoo District Municipalities, respectively.

The Brandvalley WEF will comprise of up to 70 turbines, with a generating capacity of between 1.5MW and 4MW each and a foundation of 25m in diameter and 4m in depth. The turbine structures will have a maximum hub height of up to 120m per turbine and a rotor diameter of up to 140m. The total maximum generating capacity will be 140MW, in accordance with the maximum generation capacity per WEF as stipulated under the Department of Energy's Renewable Energy Independent Power Producer Procurement Programme (REIPPPP).

Brandvalley WEF is being developed in parallel to a second 140MW WEF (Rietkloof WEF), proposed by Rietkloof Wind Farm (Pty) Ltd, another subsidiary of G7. The Rietkloof WEF is proposed on adjacent properties to the Brandvalley WEF, some of which overlap in this application for Environmental Authorisation (EA). Two separate Environmental Impact Assessment (EIA) processes will be undertaken for each WEF, with the intention of running in parallel. Two separate Basic Assessments (BAs) will also be undertaken to assess the grid connection alternatives and overhead power lines. The EIA process will be further discussed in Section 1.2 below.

1.2 The Environmental Impact Assessment Process

The protection and management of the environment within South Africa is governed by various items of legislation, within the regulatory framework of the Constitution of the Republic of South Africa (Act 108 of 1996). The primary legislation regulating EIAs within South Africa is the National Environmental Management Act (NEMA), which makes provision for the Minister of Environmental Affairs to identify activities, which may not commence prior to the authorisation granted by either the Minister or the provincial Member of the Executive Council (MEC). In addition, NEMA provides for the formulation of regulations in respect of such authorisations.

The EIA process is guided by Regulations made in terms of Chapter 5 of NEMA, which came into effect on 4th December 2014. The Regulations set out the procedures and criteria for the submission, processing and consideration of, and decisions on, applications for the environmental authorisation of activities.

1.3 Listed Activities Applied For

Three lists of activities, provided in the Regulations published on 4 December 2014, as Government Notice Numbers R.983, R.984, and R.985. These define whether the impacts of the development should be subjected to a Basic Assessment (BA) process, which applies to activities with limited environmental impacts (GN R.983 and R.984), or whether a more rigorous, two-tiered approach comprising of a Scoping and Environmental Impact Assessment (EIA) will be required. The latter is necessary in order to assess activities with potentially more significant environmental impacts, both in extent and duration (GN R.985). The listed activities triggered by the proposed Brandvalley WEF are listed in Table 1-1 below.

Table 1-1: Listed activities triggered by the proposed Brandvalley WEF.

Listed activity as described in GN R 983, 984 and 985	Description of project activity that triggers listed activity
<p>GN 983, 11(i): Listing Notice 1 of R.983 EIA Regulations dated 4 December 2014. Activity No. 11:</p> <p>The development of facilities or infrastructure for the transmission and distribution of electricity from a renewable resource where –</p> <p>(i) outside urban areas or industrial complexes with a capacity of more than 33 but less than 275 kilovolts.</p>	<p><i>The project will entail construction of substations and power line/s with a capacity of 33kV or more but less than 275kV (outside an urban area).</i></p>
<p>GN 983, 12(x), (xii), (a) and (c): Listing Notice 1 of R.983 EIA Regulations dated 4 December 2014. Activity No. 12:</p> <p>The development of –</p> <p>(x) buildings exceeding 100 square metres in size; or</p> <p>(xii) infrastructure or structures with a physical footprint of 100 square metres or more;</p> <p>Where such development occurs –</p> <p>(a) within a watercourse;</p> <p>(c) if no development setback exists, within 32 metres of a watercourse, measured from the edge of a watercourse.</p>	<p><i>Associated infrastructure and structures with a physical footprint of 100 square metres or more, such as turbines, substations, access roads, or buildings and other associated infrastructure exceeding 100 square metres will be constructed within a watercourse or within 32 metres of a watercourse.</i></p>
<p>GN 983, 19(i): Listing Notice 1 of R.983 EIA Regulations dated 4 December 2014. Activity No. 19:</p> <p>The infilling or depositing of any material of more than 5 cubic metres into, or the dredging, excavation, removal or moving of soil, sand, shells, shell grit, pebbles or rock of more than 5 cubic metres from –</p> <p>(i) a watercourse.</p>	<p><i>The construction of access roads, cabling, turbines and other associated infrastructure will require the infilling or depositing of material of more than 5 cubic metres into a watercourse or the dredging, excavation, removal of more than 5 cubic metres from a watercourse.</i></p>
<p>GN 983, 21: Listing Notice 1 of R.983 EIA Regulations dated 4 December 2014. Activity No. 21:</p>	<p><i>Brandvalley as the lawful occupier of the land would require material for the upgrade of roads and are therefore exempted from</i></p>

Listed activity as described in GN R 983, 984 and 985	Description of project activity that triggers listed activity
<p>Any activity including the operation of that activity which requires a mining permit in terms of section 27 of the Mineral and Petroleum Resources Development Act, 2002 (Act No. 28 of 2002), including associated infrastructure, structures and earthworks directly related to the extraction of a mineral resource, including activities for which an exemption has been issued in terms of section 106 of the Mineral and Petroleum Resources Development Act, 2002 (Act No. 28 of 2002).</p>	<p><i>applying for a mining permit in terms of Section 106 of the MPRDA. Borrow pits and or quarries will be required to source aggregate and therefore this activity are applicable. The competent authority for this listed activity will be the Department of Mineral Resources (DMR).</i></p>
<p>GN 983, 24(ii): Listing Notice 1 of R.983 EIA Regulations dated 4 December 2014. Activity No. 24:</p> <p>The development of –</p> <p>(ii) a road with a reserve wider than 13,5 meters, or where no reserve exists where the road is wider than 8 metres.</p>	<p><i>The WEF will require access roads with parts wider than 8m in width (up to 12m in width), to be constructed outside urban areas, with no reserve.</i></p>
<p>GN 983, 28(ii): Listing Notice 1 of R.983 EIA Regulations dated 4 December 2014. Activity No. 28:</p> <p>Residential, mixed, retail, commercial, industrial or institutional developments where such land was used for agriculture or afforestation on or after 01 April 1998 and where such development:</p> <p>(ii) will occur outside an urban area, where the total land to be developed is bigger than 1 hectare.</p>	<p><i>The development footprint for the proposed WEF (infrastructure and associated areas) will cover an area greater than 1 hectare on land currently used for agriculture outside of an urban area.</i></p>
<p>GN 984, 1: Listing Notice 2 of R984 EIA Regulations dated 4 December 2014. Activity No. 1:</p> <p>The development of facilities or infrastructure for the generation of electricity from a renewable resource where the electricity output is 20 megawatts or more.</p>	<p><i>The WEF will generate an electricity output of more than 20MW. Brandvalley WEF will apply to have contracted capacity of up to 140 MW.</i></p>
<p>GN 984, 15: Listing Notice 2 of R984 EIA Regulations dated 4 December 2014. Activity No. 15:</p> <p>The clearance of an area of 20 hectares or more of indigenous vegetation.</p>	<p><i>Land clearance of an area of 20 hectares or more of indigenous vegetation will occur during the construction phase of the WEF and associated infrastructure.</i></p>
<p>GN 984, 17: Listing Notice 2 of R984 EIA Regulations dated 4 December 2014. Activity No. 17:</p> <p>Any activity including the operation of that activity which requires a mining right as contemplated in section 22 of the Mineral and Petroleum Resources Development Act, 2002 (Act No. 28 of 2002), including associated infrastructure, structures and earthworks, directly related to the extraction of a mineral resource, including activities for which an</p>	<p><i>Brandvalley as the lawful occupier of the land would require material for the upgrade of roads and are therefore exempted from applying for a mining permit in terms of Section 106 of the MPRDA. Borrow pits and or quarries will be required to source aggregate and therefore this activity are applicable. The competent authority for this listed activity will be the DMR.</i></p>

Listed activity as described in GN R 983, 984 and 985	Description of project activity that triggers listed activity
<p>exemption has been issued in terms of section 106 of the Mineral and Petroleum Resources Development Act, 2002 (Act No. 28 of 2002).</p>	
<p>GN 985, 4: 4(a) (ii) (bb), (cc), (dd) and (ee) and 4(f) (i) (aa) Listing Notice 3 of R985 EIA Regulations dated 4 December 2014. Activity No. 4:</p> <p>The development of a road wider than 4 metres with a reserve less than 13,5 metres.</p> <p>(a) Northern Cape</p> <p>(ii) Outside urban areas, in:</p> <p>(bb) National Protected Area Expansion Strategy Focus Area;</p> <p>(cc) Sensitive areas as identified in an environmental management framework as contemplated in chapter 5 of the Act and as adopted by the competent authority;</p> <p>(dd) Sites or areas identified in terms of an International Convention;</p> <p>(ee) Critical biodiversity areas as identified in systematic biodiversity plans adopted by the competent authority or in bioregional plans.</p> <p>f) In Western Cape:</p> <p>i. Areas outside urban areas;</p> <p>(aa) Areas containing indigenous vegetation;</p>	<p><i>The access roads proposed within the Northern Cape will be wider than 4 meters with a reserve less than 13.5 metres, outside of urban areas within areas earmarked for expansion of protected areas, sensitive areas in terms of the National Wetlands Inventory and the National Freshwater Ecosystem Priority Areas (NFEPA) (as there are important wetlands and wetlands and rivers of NFEPA status) and within areas identified as Critical Biodiversity Areas (CBAs) and Ecological Support Area (ESA). These will be confirmed in the EIA Report.</i></p> <p><i>The access roads proposed within the Western Cape will be wider than 4 meters with a reserve less than 13.5 metres, outside of urban areas within areas containing indigenous vegetation.</i></p>
<p>R985, 12: 12(a) (i) and (ii) and 12(d) (i) (ii) Listing Notice 3 of R985 EIA Regulations dated 4 December 2014. Activity No. 12:</p> <p>The clearance of an area of 300 square metres or more of indigenous vegetation.</p> <p>a) Western Cape province:</p> <p>(i) Within any critically endangered or endangered ecosystem listed in terms of section 52 of the NEMBA or prior to the publication of such a list, within an area that has been identified as critically endangered in the National Spatial Biodiversity Assessment 2004;</p> <p>(ii) Within critical biodiversity areas identified in bioregional plans; or</p> <p>(d) In Northern Cape:</p> <p>(i) Within any critically endangered or endangered ecosystem listed in terms of section 52 of the NEMBA or prior to the publication of such a list, within an area that has been identified as critically endangered in the National Spatial Biodiversity Assessment 2004</p>	<p><i>Land clearance of an area of 300 square meters or more of indigenous vegetation will take place during the construction phase of the proposed project.</i></p> <p><i>According to the desktop study, there are no threatened terrestrial ecosystems identified within the project area. There are wetlands and rivers of NFEPA status found within the project area. This will be verified by an ecologist.</i></p> <p><i>The project does, however, fall within a CBA and an ESA in terms of the Cape Winelands District Municipality, a T2 CBA in terms of the Namakwa Municipality and a CBA and an ESA in terms of the Central Karoo District Municipality.</i></p> <p><i><u>Note: the systematic biodiversity plans adopted by the competent authority or in</u></i></p>

Listed activity as described in GN R 983, 984 and 985	Description of project activity that triggers listed activity
<p>(ii) Within Critical biodiversity areas identified in bioregional plans.</p>	<p><u>bioregional plans have not been formally adopted by the competent authority for the Western Cape.</u></p>
<p>GN 985, 14 (x) (xii) 14(a) and (c), (a) (ii) (bb) (dd) (ee) and (ff) and 14(f) (i) (bb) (dd) (ee) and (ff); Listing Notice 3 of R.985 EIA Regulations dated 4 December 2014. Activity No. 14:</p> <p>The development of –</p> <p>(x) buildings exceeding 10 square metres in size;</p> <p>(xii) infrastructure or structures with a physical footprint of 10 square metres or more;</p> <p>Where such development occurs –</p> <p>(a) within a watercourse;</p> <p>(c) if no development setback has been adopted, within 32 metres if a watercourse, measured from the edge of a watercourse.</p> <p>(a) In Northern Cape:</p> <p>(ii) Outside urban areas, in:</p> <p>(bb) National Protected Area Expansion Strategy Focus areas;</p> <p>(dd) Sensitive areas as identified in an environmental management framework as contemplated in chapter 5 of the Act and as adopted by the competent authority.</p> <p>(ee) Sites or areas identified in terms of an International Convention.</p> <p>(ff) Critical biodiversity areas or ecosystems service areas as identified in systematic biodiversity plans adopted by the competent authority or in bioregional plans.</p> <p>(f) In Western Cape:</p> <p>i. Outside urban areas, in:</p> <p>(bb) National Protected Area Expansion Strategy Focus areas;</p> <p>(dd) Sensitive areas as identified in an environmental management framework as contemplated in chapter 5 of the Act and as adopted by the competent authority.</p> <p>(ee) Sites or areas identified in terms of an International Convention.</p> <p>(ff) Critical biodiversity areas or ecosystems service areas as identified in systematic biodiversity plans adopted by the competent authority or in</p>	<p>Infrastructure exceeding these footprints will occur within 32 metres of a watercourse, in the Northern and Western Cape outside of urban areas within areas earmarked for expansion of protected areas, sensitive areas in terms of the National Wetlands Inventory and the National Freshwater Ecosystem Priority Areas (NFEPA) (as there are important wetlands and wetlands and rivers of NFEPA status) and within areas identified as CBAs and ESAs. These will be confirmed in the EIA Report.</p> <p><u>Note: the Environmental Management Framework for the Cape Winelands District Municipality has not been formally adopted by the competent authority.</u></p> <p><u>Note: the systematic biodiversity plans adopted by the competent authority or in bioregional plans have not been formally adopted by the competent authority for the Western Cape.</u></p>

Listed activity as described in GN R 983, 984 and 985	Description of project activity that triggers listed activity
bioregional plans.	
<p>R985, 18(a) (ii) (bb) (cc) (dd) and (ee) (ii) and 18(f) (i) (aa) ;</p> <p>Listing Notice 3 of R.985 EIA Regulations dated 4 December 2014. Activity No. 18: The widening of a road by more than 4 metres, or the lengthening of a road by more than 1 kilometre.</p> <p>(a) In Northern Cape province:</p> <p>ii. Outside urban areas, in:</p> <p>(bb) National Protected Area Expansion Strategy Focus areas;</p> <p>(cc) Sensitive areas as identified in an environmental management framework as contemplated in chapter 5 of the Act and as adopted by the competent authority.</p> <p>(dd) Sites or areas identified in terms of an International Convention;</p> <p>(ee) Critical biodiversity areas or ecosystems service areas as identified in systematic biodiversity plans adopted by the competent authority or in bioregional plans.</p> <p>(ii) Areas on the watercourse side of the development setback line or within 100 metres from the edge of a watercourse where no such setback line has been determined; or</p> <p>(f) Western Cape:</p> <p>i. All areas outside urban areas:</p> <p>(aa) Areas containing indigenous vegetation.</p>	<p><i>The upgrading of the roads for the project will involve widening and/or lengthening of existing access roads.</i></p> <p><i>The undertaking of this activity will take place in the Northern Cape Province, outside urban areas within areas earmarked for expansion of protected areas, sensitive areas in terms of the National Wetlands Inventory and the National Freshwater Ecosystem Priority Areas (NFEPA) (as there are important wetlands and wetlands and rivers of NFEPA status) and within areas identified as CBAs and ESAs as well as in the Western Cape, in areas outside of urban areas containing indigenous vegetation.</i></p> <p><i>These will be confirmed in the EIA Report.</i></p>

The proposed development activities trigger at least one listed activity from GN R984 and therefore require a full Scoping and EIA. The Scoping and EIA process is regulated by Chapter 4, Part 3 and Appendices 2,3,4,6 and 7 of the 2014 EIA Regulations.

It is important to note that in addition to the requirements for an authorisation in terms of the NEMA, there may be additional legislative requirements, which need to be considered prior to commencing with the activity.

1.4 Phases of the EIA Process

An EIA process consists of four phases, namely the Pre-Assessment Public Participation Process (PPP) Phase, the Scoping Phase (the current phase), the Specialist Phase and the EIA Phase. These phases are depicted in the flow-diagram provided in Figure 1-1.

The EIA process is initiated through a Pre-Assessment PPP. The pre-assessment process is not a mandatory requirement in terms of the EIA Regulations (2014) but a beneficial option for the client and EAP in order to identify key stakeholders and Interested and Affected Parties (I&APs) as well as to identify any fatal flaws at the onset of a project.

This phase is followed by the Scoping Phase (inclusive of a notice of intent to the authorities), as shown in Figure 1-1. During the Scoping Phase, the Terms of Reference for the full EIA is formulated, and requirements from the authorities clarified. The Scoping Process serves to further inform the I&APs of the proposed activities and to consult with relevant government departments, allowing for the identification of potential issues and concerns.

After completion of the Scoping Phase, detailed specialist studies will be undertaken in order to address issues identified during the Scoping Phase. Specialists are expected not only to provide baseline information in their particular field of expertise for the study area, but also to take this study further and identify which project actions will result in significant impacts. Consultants are also expected to suggest ways in which these negative impacts could be mitigated, to reduce their severity.

The specialist investigations will inform the EIA Phase. A comprehensive EIA report will be compiled, documenting the outcome of the specialist impact assessments. All Draft Reports are submitted for public review, during which time the Environmental Assessment Practitioner (EAP) presents the key findings to all I&APs at the provincial and local levels. All comments made by I&APs are captured in a Comments and Response Table, and in this table responses to all issues and concerns raised during the public review period are provided.

All recommendations cited in the EIA Report must be detailed in an Environmental Management Programme report (EMPr or EMP), which defines the actions to be implemented. EMPs are recognised as very important tools for the sound environmental management of projects.

The Scoping and EIA Reports, along with all comments received during the PPP, will be submitted to the Department of Environmental Affairs (DEA) for decision-making.

PRE-ASSESSMENT PUBLIC PARTICIPATION PROCESS (PPP) PHASE

- Identification of key stakeholders and Interested and Affected Parties (I&APs)
- Distribution of PPP Documents (Background Information Document, Notification letters, placement of posters and site notices)



SCOPING PHASE (44 DAYS)

ACTIVITY	TIMEFRAME
Submission of Application	-
Authority Acknowledgement	10 days after receipt of Application
Public Review of Draft Scoping Report (DSR)	30 days
Submission of Final Scoping Report (FSR)	44 days from receipt of acknowledgment of Application
Consideration by Authorities	43 days from receipt of FSR



SPECIALIST PHASE



EIA PHASE (106 DAYS)

ACTIVITY	TIMEFRAME
Public Review of Draft Environmental Impact Report (DEIR) and Environmental Management Programme (EMPr)	30 days
Submission of Final Environmental Impact Report (FEIR) and Environmental Management Programme (EMPr)	106 days from Acceptance of Scoping Report
Notification of extension of additional 50 days	Must be lodged within 106 days of Acceptance of Scoping Report. Extension period allows for a further 50 days to submit the EIR (i.e. within 156 days).
Environmental Authorisation Decision	107 days from receipt of FEIR
EA Notification	Authority to notify Applicant within 5 days 14 days to notify I&APs
Environmental Authorisation Appeal Finalised	90 days from Environmental Authorisation Decision

Figure 1-1: The EIA process.

The DEA, formerly the Department of Environmental Affairs and Tourism (DEAT), is the competent authority that must consider and decide on the application for authorisation in respect of the activities listed in Table 1-1. All electricity-related projects, including generation, transmission and distribution, are to be submitted to DEA, irrespective of the nature of the application. This decision has been made in terms of Section 24(C)(3) of NEMA.

I&APs will be notified of DEA's decision and informed of their right to appeal this decision.

The environmental processes will be undertaken in accordance with the requirements of the National Environmental Management Act No. 107 of 1998 (as amended) (NEMA), and the 2014 Environmental Impact Assessment (EIA) Regulations promulgated in terms of this Act (Government Notice (GN) No R.982, R.983, R.984 and R.985)

EOH Coastal & Environmental Services (CES) is the consultancy appointed by Brandvalley Wind Farm (Pty) Ltd to undertake the EIA process, with Marc Hardy designated as the Environmental Assessment Practitioner (EAP) that will manage this process.

1.5 The Scoping Phase

The proposed project is currently in the Scoping Phase. The aim of this phase is to determine, in detail, the scope of the subsequent EIA to be conducted in fulfilment of the application for Environmental Authorisation of the proposed activities listed in Section 1.3 above. The potential environmental issues and impacts associated with the proposed project activities are identified during the Scoping Phase, thus determining the need and extent of further investigation required in the EIA. This Scoping Report is compiled in accordance with the requirements as stipulated in Section 21 and Appendix 2 of the EIA regulations (GNR 982), which clearly outline the content of a Scoping Report.

The principal objectives of the Scoping Phase in accordance with the regulatory requirements GN R. 982 Appendix 2 (1) are to:

- a) *Identify the relevant policies and legislation relevant to the activity;*
- b) *Motivate the need and desirability of the proposed activity, including the need and desirability of the activity in the context of the preferred location;*
- c) *Identify and confirm the preferred activity and technology alternative through an impact and risk assessment and ranking process;*
- d) *Identify and confirm the preferred site, through a detailed site selection process, which includes an impact and risk assessment process inclusive of cumulative impacts and a ranking process of all the identified alternatives focusing on the geographical, physical, biological, social, economic, and cultural aspects of the environment;*
- e) *Identify the key issues to be addressed in the assessment phase;*
- f) *Agree on the level of assessment to be undertaken, including the methodology to be applied, the expertise required as well as the extent of further consultation to be undertaken to determine the impacts and risks the activity will impose on the preferred site through the life of the activity, including the nature, significance, consequence, extent, duration and probability of the impacts to inform the location of the development footprint within the preferred site; and*
- g) *Identify suitable measures to avoid, manage or mitigate identified impacts and to determine the extent of the residual risks that need to be managed and monitored.*

An integral part of the Scoping Phase is the commencement of the PPP, undertaken throughout the project to ensure that all possible I&APs are informed of the proposed activity and are provided an opportunity to comment and identify any issues or concerns.

This Scoping Report is structured as follows:

Chapter 1 – Introduction: Provides background information on the proposed project, a brief description of the EIA process as required by NEMA and its associated Regulations, and describes

the key steps in the EIA process that have been undertaken thus far, and those that are still to be undertaken. The details and expertise of the EAP conducting the environmental assessment and preparing the reports are also provided in this Chapter.

Chapter 2 – Project Description: Provides a description of the proposed development, a description of the activities and technical details of the process to be undertaken, the proposed location/properties on which the development is to occur and the preliminary layout of the development and its associated infrastructure.

Chapter 3 - Alternatives: Provides a brief discussion of the identified and considered feasible and reasonable alternatives to the proposed activities, some of which will be investigated further in the EIA Phase.

Chapter 4 – Need and desirability of the project: Provides motivation on the need and desirability of the proposed development with respect to international and national plans and policies.

Chapter 5 – Relevant Legislation: Identifies all the legislation and guidelines that have been considered in the preparation of this Scoping Report and that are applicable to the EIA process.

Chapter 6 – Description of the Affected Environment: Provides a brief overview of the bio-physical and socio-economic characteristics of the project area and its surrounding area that may be affected by the proposed development. The information provided in this Chapter is largely sourced from literature, publications and data available for the area. This information is subsequently supplemented by findings from the site visit.

Chapter 7 – Issues/ impacts Identified during Scoping: Provides a description of the key issues and potential impacts that have been identified by the project team and through discussions with I&APs during the Scoping Phase. These issues and impacts will be further assessed in the EIA Phase.

Chapter 8 – Public Participation Process: Provides details of the Public Participation Process conducted in terms of GN R.982, describing the measures undertaken thus far to notify Interested and Affected Parties (I&APs) and providing proof of such; including the placement of notice boards, advertisements and the distribution of notification letters and Background Information Documents (BIDs). A list of all persons, organisations and stakeholders that were identified and registered as Interested and Affected Parties (I&APs) is provided in this Chapter, in accordance with the Regulations.

Chapter 9 - Plan of Study for EIA: Sets out the proposed approach to the Environmental Impact Assessment of the proposed project including:

- A description of the scope of work that will be undertaken as part of the EIA Phase, including any specialist reports or specialised processes, and the manner in which the described scope of work will be undertaken;
- An indication of the stages at which the competent authority will be consulted;
- A description of the proposed methodology for assessing the environmental issues and alternatives, including the option of not proceeding with the proposed development;
- Particulars of the Public Participation Process that will be conducted during the EIA Phase; and
- Any specific information required by the authority.

Chapter 10 – Conclusion: Provided conclusions, recommendations and a way forward for the proposed project.

References: Cites any texts referred to during preparation of this report.

Appendices: Containing all supporting information

1.6 Details and Expertise of the Environmental Consulting Company and EAP

According to Regulation 13 of the EIA Regulations (GN R. 982 of 2014), *An EAP must –*
 (a) *be independent; and*
 (b) *have expertise in conducting Environmental Impact Assessments, including knowledge of the Act, these Regulations and any guidelines that have relevance to the proposed activity.*

In fulfilment of the above-mentioned legislative requirement, the details of the EAP that prepared this Draft Scoping Report as well as the expertise of the individual members of the study team are provided below.

1.6.1 Details of the Environmental Consulting Company

Coastal and Environmental Services (CES), trading as EOH Coastal & Environmental Services

Physical Address (Head Office): 67 African Street, Grahamstown 6139

Physical Address (Branch): The Point, Suite 408, 4th Floor, 76 Regent Road, Sea Point 8005

Postal Address: P.O. Box 934, Grahamstown 6140

Telephone: +27 46 622 2364 (Head Office); +27 21 045 0900 (Branch)

Fax: +27 46 622 6564

Website: www.cesnet.co.za

Email: info@cesnet.co.za

1.6.2 Expertise of EOH CES, the EAP and the Project Team

EOH Coastal & Environmental Services is a South African based company, established in 1990, to service the field of Environmental Management and Impact Assessment. Our principal area of expertise is in assessing the impacts of development on the natural, social and economic environments through, among other instruments, the Environmental Impact Assessment (EIA) process, and in so doing contribute towards sustainable development. Provided below are summarised qualifications for each of the team members involved in the EIA to date. A full *Curriculum Vitae (CV)* for the EAP, Marc Hardy, is provided in Appendix D of this report.

Mr Marc Hardy

(Role: Environmental Assessment Practitioner, Project Leader and Reviewer)

Marc holds a M.Phil in Environmental Management from Stellenbosch University's School of Public Management and Planning. His professional interests include environmental impact reporting for linear, energy and bulk infrastructure projects, strategic environmental policy development and reporting – mostly relating to Environmental Management Framework's (EMF's) - compliance monitoring and environmental auditing. Marc has, amongst others, been project manager for the Dinokeng EMF (Gauteng), the Milnerton Refinery to Ankerlig Power Station Liquid Fuels Transportation Infrastructure Project, numerous Eskom Transmission and Distribution power line and substation EIA's countrywide, mining EMPR compliance audits, compliance audits for Camden, Grootvlei and Komati Power Stations and the hazardous waste management facility for the Coega Development Corporation (Coega IDZ). Before entering the consulting field he gained extensive experience in the EIA regulatory field whilst in the employ of the Gauteng Department of Agriculture, Conservation and Environment - being responsible for the review of infrastructure projects like the Gautrain Rapid Rail system and representing the Department on various EMF project steering committees. He is currently managing numerous EIA processes for wind energy developments countrywide, as well as renewable energy and mining projects throughout Africa.

Ms Amber Jackson

(Role: Project Manager and Report Production)

Amber, Senior Environmental Consultant at CES, holds an MPhil in Environmental Management and has a background in both Social and Ecological work. Her undergraduate degrees focused on Ecology, Conservation and Environment with particular reference to landscape effects on

Herpetofauna, while her masters focused on the environmental management of social and ecological systems. With a dissertation in food security that investigated the complex food system of informal and formal distribution markets. She has been involved in managing the Environmental and Social Impact Assessment for two large forestry plantation projects in Mozambique (Green Resources) and numerous wind farm applications in South Africa. During her time at CES she has co-ordinated specialist studies, put together the Impact Reports, prepared the Issues and Response trails and managed the compilation of the Social and Environmental Management Programmes and Monitoring Programmes. She has been involved in ecological studies in Mozambique and South Africa. Interests include, ecological studies dealing with indigenous fauna and flora, as well as land use and natural resource management. She is registered as a candidate Professional Natural Scientist in the field of Environmental Science through the South African Council for Natural Scientific Professions (SACNASP).

Ms Belinda Huddy

(Role: Report Production and Public Participation)

Belinda, Environmental Consultant at CES, holds an MPhil in Environment, Society and Sustainability and a Bachelor of Business Science (Hons) in Economics both obtained from the University of Cape Town. Her master's dissertation explored alternative values, focusing on the social values, attached to the Cape Town Talent Exchange. Her honours thesis investigated the determinants of the success and failures of the bio-diesel industry, focusing on a jatropha plantation in Zambia. Courses in her master's degree include Theory and Practice of Environment Management, Managing Complex Human-Ecological Systems, Environmental Law and Cultural Geography. The relevant courses in her honours degree included Environmental Economics and Natural Resource Economics.

1.7 Assumptions and Limitations

This report is based on information that is currently available and, as a result, the following limitations and assumptions under which this report was compiled are implicit:

- Descriptions of the natural and social environments are based on limited fieldwork and available literature. More information will be provided in the EIA phase based on the outcomes of the specialist studies.
- The report is based on a project description taken from preliminary design specifications and site layouts for the proposed WEF that have not yet been finalised and are likely to undergo a number of iterations and refinements (based on environmental and technical inputs) before they can be regarded as definitive. All potential turbine position alternatives will, however, be contained within the property boundaries of the project area.
- The preliminary turbine site layout and associated infrastructure will be presented in the EIA Phase and subject to the necessary specialist assessment. It is anticipated that this preliminary layout will be further refined as per the outcomes of these studies and overall EIA findings.

2. PROJECT DESCRIPTION

According to Appendix 2(2) of the EIA Regulations (GN R. 982 of 2014), a *Scoping Report* must contain all the information necessary for a proper understanding of the process, informing all preferred alternatives, including location alternatives, the scope of the assessment, and the consultation process to be undertaken through the Environmental Impact Assessment process, and must include:

- (b) the location of the activity, including -
 - (i) the 21 digit Surveyor General code of each cadastral land parcel;
 - (ii) where available, the physical address and farm name;
 - (iii) where required information in items (i) and (ii) is not available, the coordinates of the boundary of the property or properties.
- (c) a plan which locates the proposed activity or activities applied for at an appropriate scale; or, if it is –
 - (i) a linear activity, a description and coordinates of the corridor in which the proposed activity or activities is to be undertaken;
 - (ii) on land where the property has not been defined, the coordinates within which the activity is to be undertaken.
- (d) a description of the scope of the proposed activity, including –
 - (ii) a description of the activities to be undertaken, including associated structures and infrastructure.

In line with the above-mentioned legislative requirement, this chapter identifies the site location of the proposed Brandvalley WEF and provides a description of its various components and arrangements on the site.

2.1 Location and Site Description of the Proposed Development

Brandvalley Wind Farm (Pty) Ltd proposes to develop a WEF on the border of the Northern Cape and Western Cape Provinces of South Africa. In the Northern Cape, the proposed project falls within the Karoo Hoogland Local Municipality and within the Namakwa District Municipality. In the Western Cape, the WEF falls within the Witzenburg Local Municipality and the Laingsburg Local Municipality and within the Cape Winelands and the Central Karoo District Municipalities, respectively.

Sutherland is the closest town within the Northern Cape Province and is situated approximately 60km north of the project area. The closest town within the Western Cape Province is Matjiesfontein, situated 30km south of the project area. Laingsburg is a further 30km east of Matjiesfontein, along the N1 national road in the Western Cape Province.

The project area can be accessed via the R354 that connects to the N1 between Matjiesfontein and Laingsburg. The R354 is the main arterial road providing access to the project area, where there are a number of existing local, untarred roads providing access within the project area.

The proposed Brandvalley WEF falls across eleven (11) farm portions, provided in Table 2-1 below. These land portions, collectively referred to as the project area for the Brandvalley WEF, are currently used for animal husbandry, game farming and agriculture, including grazing of sheep.

Table 2-1: Farm Portions on which the Proposed Development is Located¹.

Description of affected farm portions			
Farm Name and Number	21 digit SG Code	Municipality/ Province	Farm size (ha)
The Remainder of Barendskraal 76	C0430000000007600000	Laingsburg LM / Central Karoo DM / Western Cape	1,518.5
Portion 1 of Barendskraal 76	C0430000000007600001	Laingsburg LM / Central Karoo DM / Western Cape	2,826.3
The Remainder of Brandvalley 75	C0430000000007500000	Laingsburg LM / Central Karoo DM / Western Cape	1,992.5
Portion 1 of Brandvalley 75	C0430000000007500001	Laingsburg LM / Central Karoo DM / Western Cape	56.3
The Remainder of Fortuin 74	C0430000000007400000	Laingsburg LM / Central Karoo DM / Western Cape	2,411.7
Portion 3 Fortuin 74	C0430000000007400003	Laingsburg LM / Central Karoo DM / Western Cape	1,862.4
The Remainder of Kabeltouw 160	C01900000000016000000	Laingsburg LM / Central Karoo DM / Western Cape	1,072.6
The Remainder of Muishond Rivier 161	C01900000000016100000	Witzenberg (Ceres) LM/ Cape Winelands DM/ Western Cape	4,014.1
Portion 1 of Muishond Rivier 161	C01900000000016100001	Witzenberg (Ceres) LM/ Cape Winelands DM/ Western Cape	3,366.0
Portion 1 of Fortuin 74 (Ou Mure)	C0430000000007400001	Laingsburg LM / Central Karoo DM / Western Cape	408.9
The Farm Rietfontein 197	C07200000000019700000	Karoo Hoogland LM/ Namakwa DM/ Northern Cape	5,853.3
Total hectares			25,382.60

The location of the proposed land properties is provided in Figures 2-1 below.

¹These farm entrance gates can be accessed via the R354 and existing access roads.

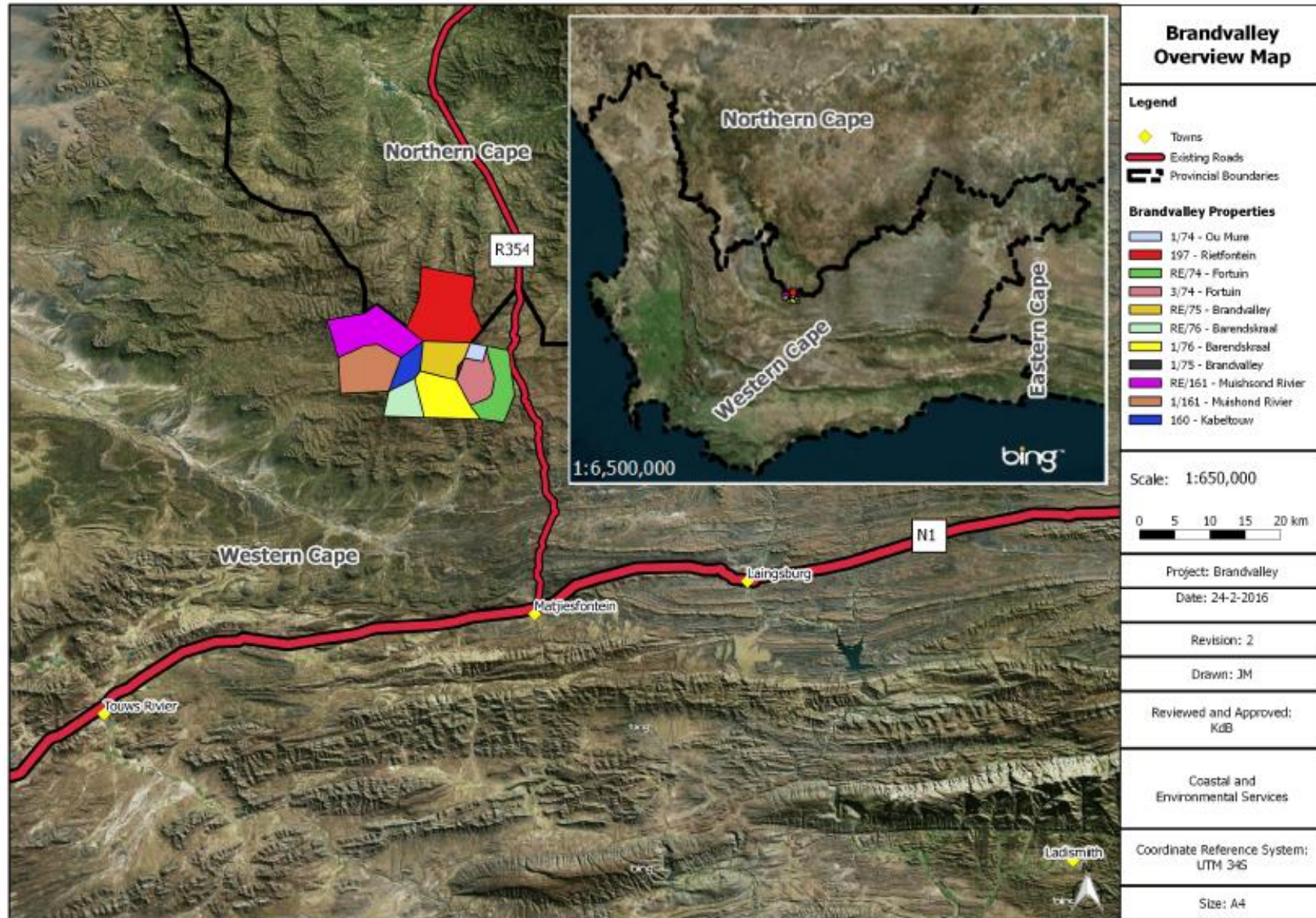


Figure 2-1: Proposed Location for the Brandvalley Wind Energy Facility.

2.2 Detailed Description of the Brandvalley WEF

Brandvalley WEF will have an energy generation capacity (at point of grid feed-in) of up to 140 megawatt (MW), and will include the following:

- Up to 70 potential wind turbine positions (between 1.5MW and 4MW in capacity each), each with a foundation of 25m in diameter and 4m in depth.
- The hub height of each turbine will be up to 120m, and the rotor diameter up to 140m.
- Permanent compacted hard-standing laydown areas for each wind turbine (70mx50m, total 24.5ha) will be required during construction and for on-going maintenance purposes.
- Electrical turbine transformers (690V/33kV) adjacent to each turbine (typical footprint of 2m x 2m, but can be up to 10m x 10m at certain locations) would be required to increase the voltage to 33kV.
- Internal access roads up to 12m wide, including structures for storm-water control would be required to access each turbine location and turning circles. Where possible, existing roads will be upgraded.
- 33kV overhead power lines linking groups of wind turbines to onsite 33/132kV substation(s). A number of potential electrical 33kV powerlines will be required in order to connect wind turbines or strings of turbines to the preferred onsite substation. The layout of the 33kV powerlines will be informed by sensitive features identified. The facility will consist of both above and below ground 33kV electrical infrastructure depending on what will require the shortest distance and result in the least amount of impacts to the environment.
- Underground 33kV cabling between turbines buried along access roads, where feasible.
- A number of potential 33/132kV onsite substation location(s) will be assessed. The footprint of these 33/132kV substation(s) will need to be assessed in both this EIA and the Basic Assessment process for electrical infrastructure as the applicant will remain in control of the low voltage components of the 33/132kV substation (including isolators, control room, cabling, transformers etc.) (assessed in this EIA), whereas the high voltage components of this substation (assessed in BA) will likely be ceded to Eskom. The total footprint of this onsite substation will be approximately 200m x 200m. The exact coordinates of the low voltage components footprint (to be assessed in this EIA) and high voltage components footprint (to be assessed in the basic assessment process) will be provided in the EIA phase.
- Up to 4 x 120m tall wind measuring lattice masts strategically placed within the wind farm development footprint to collect data on wind conditions during the operational phase.
- Temporary infrastructure including a construction camp (~10ha) and an on-site concrete batching plant (~1ha) for use during the construction phase.
- Borrow pits and quarries for locally sourcing aggregates required for construction (~4.5ha), in addition to onsite turbine excavations where required. All materials excavated will eventually be used on the compacting of the roads and hard-standing areas and no material will be sold to any third parties. The number and size of the borrow pits depends on suitability of the subsurface soils and the requirement for granular material for access road construction and other earthworks. Alternative borrow pit locations will be assessed in a separate BA process.
- Fencing will be limited around the construction camp and the entire facility would not necessarily need to be fenced off. The height of fences around the construction camp are anticipated to be up to 4m.

It is important to note that the number of turbines and grid connection options will be subject to an iterative process based on the findings of the specialist reports and technical feasibility. A conceptual layout is provided in Figure 2-3. It is important to note that this layout is preliminary and will be informed by the EIA Phase.

2.2.1 Grid Connection Infrastructure

The following infrastructure will likely be ceded to Eskom at a later stage and will therefore be assessed in a separate Basic Assessment process:

- High voltage components of the 33/132kV onsite substation including transformers, isolators, cabling, light mast and other as required by Eskom. The onsite substation will have a

footprint of up to 200m x 200m that will also house site offices, storage areas, ablution facilities and the maintenance building.

- 132kV above-ground distribution line to connect the onsite 33/132kV substation to the grid. The pylons for this line will have an average spacing of 250m to 300m.
- Extension of the Eskom high voltage infrastructure in order to connect the wind farm. There are three options being considered and the preferred option will be informed by environmental, technical considerations and Eskom's preference:
 - Extension of the existing 400kV Komsberg substation with several electrical components to be defined by Eskom (e.g. additional feeder bay, transformer bay) on the existing substation property;
 - Extension of the Bon Espirange satellite 132kV substation with several electrical components. The Bon Espirange satellite substation will be established by Eskom and other IPPs as an alternative to connecting all wind farms west of Komsberg directly to the Eskom Komsberg Substation; or
 - Construction of a central switching station (up to 200m x 200m) to be shared by both Brandvalley and Rietkloof if both are awarded preferred bidder status by the Department of Energy. If the central hub or switching station option is ultimately selected by Eskom, each project will build their own 33/132kV substation and connect to the central station. From there one 132kV line for both projects will lead to either the Komsberg or Bon Espirange substation.

2.2.2 Potentially Shared infrastructure

Depending on Eskom's requirements it might be feasible for both Brandvalley and Rietkloof to connect to a shared onsite 33/132kV substation, which could then be connected via an off-site overhead 132kV power line to Komsberg Substation. The latter could then be shared by both facilities. This would be assessed as a potential connection alternative in a separate Basic Assessment process as described above.

Access roads, laydown areas, borrow pit locations and buildings and other infrastructure will also be shared as far as feasibly possible.

2.2.3 Access Roads

Figure 2-2 below indicates the proposed and existing access roads for in the proposed project. The access roads are considered a linear activity and are further explored in Section 3.2.1.

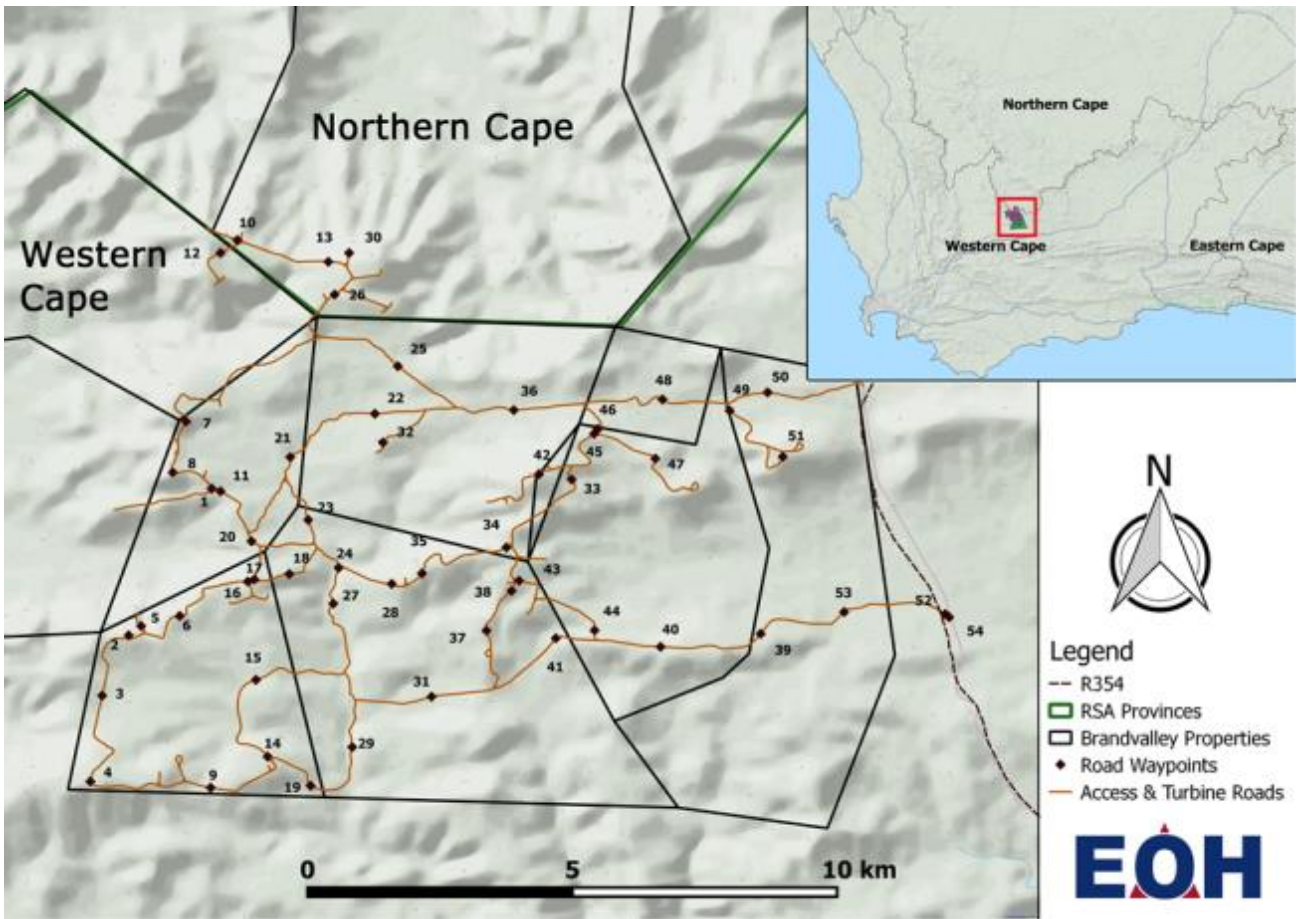


Figure 2-2: Proposed and existing access roads for the proposed project (the numbers refer to 2km intervals).

The coordinates of the access roads are provided in Table 2-2 below. The numbers shown in Figure 2-2 correspond to the numbers in Table 2-2.

Table 2-2: Coordinates of proposed and existing access roads (2km intervals).

No.	Interval	Latitude	Longitude	No.	Interval	Latitude	Longitude
1	0	445532.16	6351991.73	28	54000	448943.45	6350219.51
2	2000	443978.97	6349226.01	29	56000	448212.84	6347147.97
3	4000	443483.84	6348089.26	30	58000	448104.91	6356436.96
4	6000	443269.92	6346473.66	31	60000	449706.56	6348103.41
5	8000	444213.1	6349401.71	32	62000	448763.16	6352878.18
6	10000	444941.29	6349594.5	33	64000	452332.17	6352199.6
7	12000	445040.5	6353249.98	34	66000	451107.3	6350915.4
8	14000	444794.38	6352292.82	35	68000	449514.82	6350419.32
9	16000	445543.52	6346370.42	36	70000	451233.9	6353497.84
10	18000	445989.5	6356668.17	37	72000	450736.49	6349350.02
11	20000	445699.55	6351942.37	38	74000	451206.18	6350097.86
12	22000	445674.73	6356426.5	39	76000	455917.39	6349315.9

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13	24000	447712.59	6356269.38	40	78000	454027.98	6349061.11
14	26000	446616.37	6346960.14	41	80000	452048.25	6349212.68
15	28000	446388.05	6348403.02	42	82000	451716.48	6352295.35
16	30000	446223.68	6350248.74	43	84000	451348.14	6350291.61
17	32000	446346.91	6350288.33	44	86000	452780.27	6349364.87
18	34000	447006.62	6350393.62	45	88000	452752.76	6353060.22
19	36000	447429.59	6346418.61	46	90000	452821.33	6353150.97
20	38000	446288.56	6351006.85	47	92000	453913.1	6352598.53
21	40000	447012.54	6352591.84	48	94000	454042.94	6353711.35
22	42000	448607.99	6353416.36	49	96000	455313.68	6353506.35
23	44000	447357.76	6351413.38	50	98000	456030.28	6353853.65
24	46000	447938.33	6350516.08	51	100000	456320.62	6352644.6
25	48000	449038.23	6354312.38	52	102000	459404.93	6349701.94
26	50000	447835.19	6355653.97	53	104000	457492.7	6349730.66
27	52000	447839.98	6349843.51	54	104525	459474.45	6349642.74

2.2.5 Conceptual Layout

Figure 2-3 overleaf is the preliminary layout that has been based on technical considerations. The final road and infrastructure layout will be defined at a later stage based on the final turbines locations. The final layout will maximise the use of existing tracks where possible.

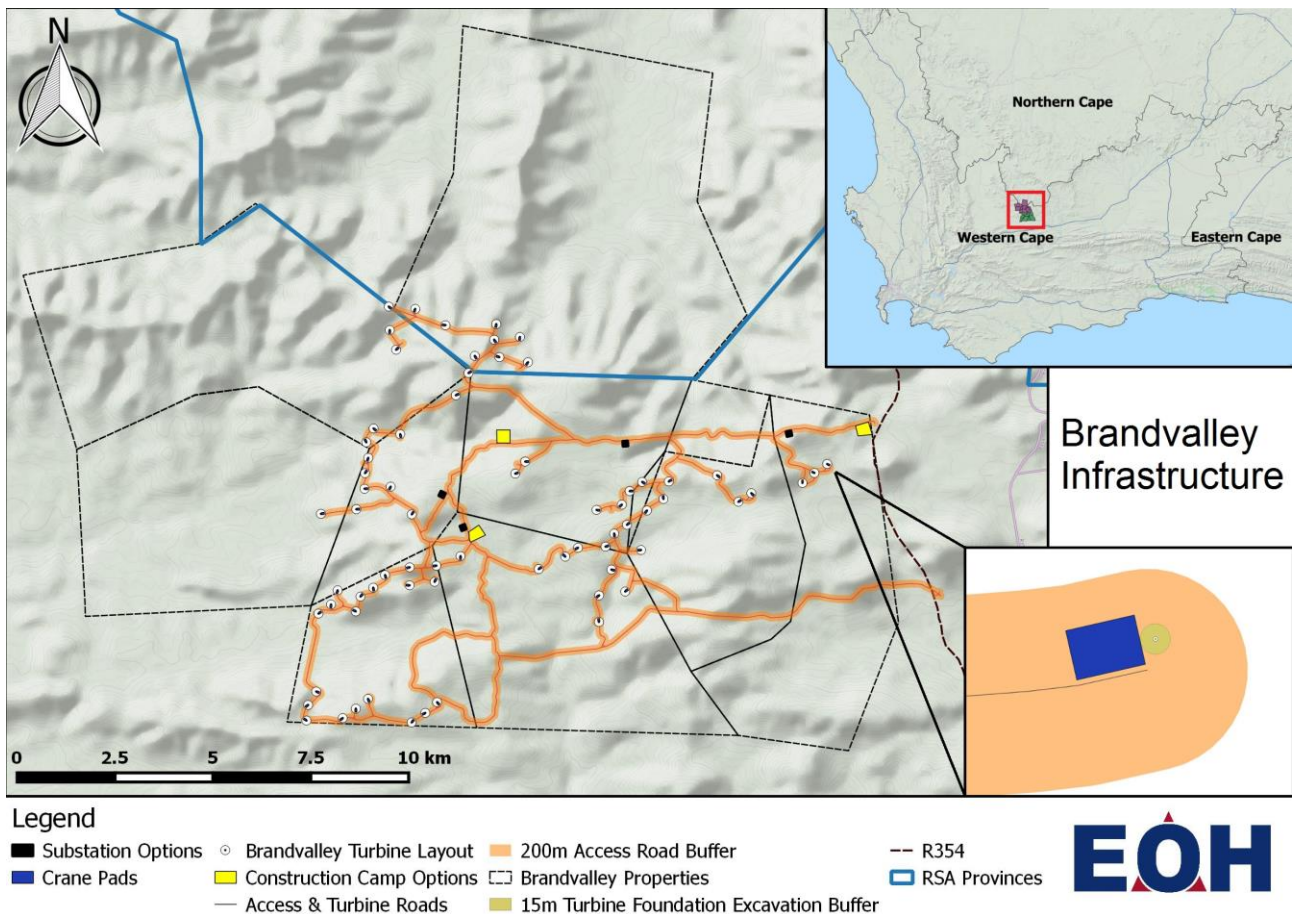


Figure 2-3: Conceptual/preliminary turbine positions, crane pad positions, on-site substation alternatives, on-site construction camp options and existing and turbine access routes for the proposed Brandvalley WEF

2.3 The Renewable Energy Independent Power Producer Programme (REIPPPP)

The limited supply of power in South Africa has given rise to Independent Power Producer Programme (IPPP), a platform established by the Department of Energy (DoE), together with the National Treasury (NT) and the Development Bank of Southern Africa (DBSA) aimed to generate electrical power from the private-sector for renewable and non-renewable energy sources. The programme focuses on power generation from onshore wind, concentrated solar thermal, solar photovoltaic, biomass solid, biogas, landfill gas, small hydro-electric schemes and cogeneration (IPP Procurement Programme, 2012).

Should this project receive an environmental authorisation, Brandvalley Wind Farm intends to bid this wind farm under the REIPPPP programme in order to supply the electricity generated to Eskom. The REIPPPP, implemented since 2011 by the DoE, is a national programme driving the procurement of renewable generation capacity from independent, private developers to secure energy for power generation. South Africa has significant potential for renewable energy projects and thus the DoE has placed a target of 10 000 Gigawatt hours (GWh) of renewable energy power generation for the country by 2016. It was determined that 3 725 Megawatts (MW) of power generation would be required from renewable energies to provide the country with uninterrupted power supply, which is in accordance with the capacity allocated to Renewable Energy generation in Integrated Resource Plan (IRP) for electricity in 2010-2030 (IPP Procurement Programme,

2012). It was initially aimed to procure 3 725MW renewable energy by 2016, however in 2012 it was announced that an additional 3 200MW of renewable energy will be procured (Creamer, 2012). In August 2015, this allocation further increased to by a renewable energy generation capacity of 6 300 MW gazetted in a Ministerial determination (DoE, 2015).

The REIPPPP comprises of a competitive bidding system initiated by a Request for Proposal (RFP) issued by the DoE for solar photovoltaic (PV), concentrated solar thermal, onshore wind, biomass solid, biogas, landfill gas, small hydro and other smaller scale renewable technologies (DoE, 2011). The Bidders are required to place bids on economic development targets and electricity tariffs, on which maximum limits are imposed for each qualifying technology. If the bidder/ project company is selected as a Preferred Bidder, the tariff will be payable by the Buyer in accordance with the Power Purchase Agreement (PPA) entered into between the Buyer (that purchases the electricity) and the bidder/ project company (that generates electricity). It is essential that the renewable energy facility procured in terms of the REIPPPP reached commercial operation (COD) by the dates set out in the RFP., referred to as the Commercial Operation Date (COD).

To date, there have been four (4) volumes or bidding windows under the REIPPPP. In April 2015, the DoE announced additional preferred bidders for the REIPPPP Bid Window 4 contributing feeding 1 121MW to the national grid and contributing to a total of 5 243MW procured since the implementation of the programme to date (DoE, 2015).

2.4 Broad-level Description of Electricity Production from Wind

Wind energy is a form of solar energy. Winds are caused by the uneven heating of the atmosphere by the sun, the irregularities of the earth's surface, and rotation of the earth. Wind flow patterns are modified by the earth's terrain, bodies of water, and vegetation. This wind flow or motion energy (kinetic energy) can be used for generating electricity. The term "wind energy" describes the process by which wind is used to generate mechanical power or electricity. Wind turbines convert the kinetic energy in the wind into mechanical power and a generator can then be used to convert this mechanical power into electricity.

A typical wind turbine consists of the following components, which are shown in Figure 2-4:

- A *rotor*, with 3 blades, which collects energy from the wind and converts the wind energy into rotational shaft motion/energy to turn the generator;
- A *nacelle* which houses the equipment at the top of the tower includes a gearbox, if required, breaks to prevent damage by switching off the turbine during very high winds and a generator that converts the turning motion/mechanical energy of the blades into electricity) and determines the speed of the rotation of the blades;
- A *tower*, to support the nacelle and rotor and to allow the blades to be distanced safely off the ground and so as to reach the stronger winds found at higher elevations. The tower must be strong enough to support the rotor and nacelle, to sustain vibrations, wind loading and to endure the overall weather elements throughout the life of the project;
- *Electronic equipment* i.e. controls, transformers, electrical cables and switchgear, ground support equipment, and interconnection equipment; and
- *Turbine step-up transformer* which can be indoor or outdoor, depending on the turbine model whose function is to increase the voltage capacity of the electricity generated by the turbine to a higher, grid-equivalent voltage.

The amount of energy the wind transfers to the rotor depends on the density of the air (the heavier the air, the more energy received by the turbine), the rotor area (the bigger the rotor diameter, the more energy received by the turbine), and the wind speed (the faster the wind, the more energy received by the turbine). The sections that follow provide a detailed explanation of the various components of a wind energy project. The electricity generated by each turbine is passed through a step-up transformer and then transmitted via 33kV to underground and/or overhead cables into a central substation, which connects the project to a high voltage network.

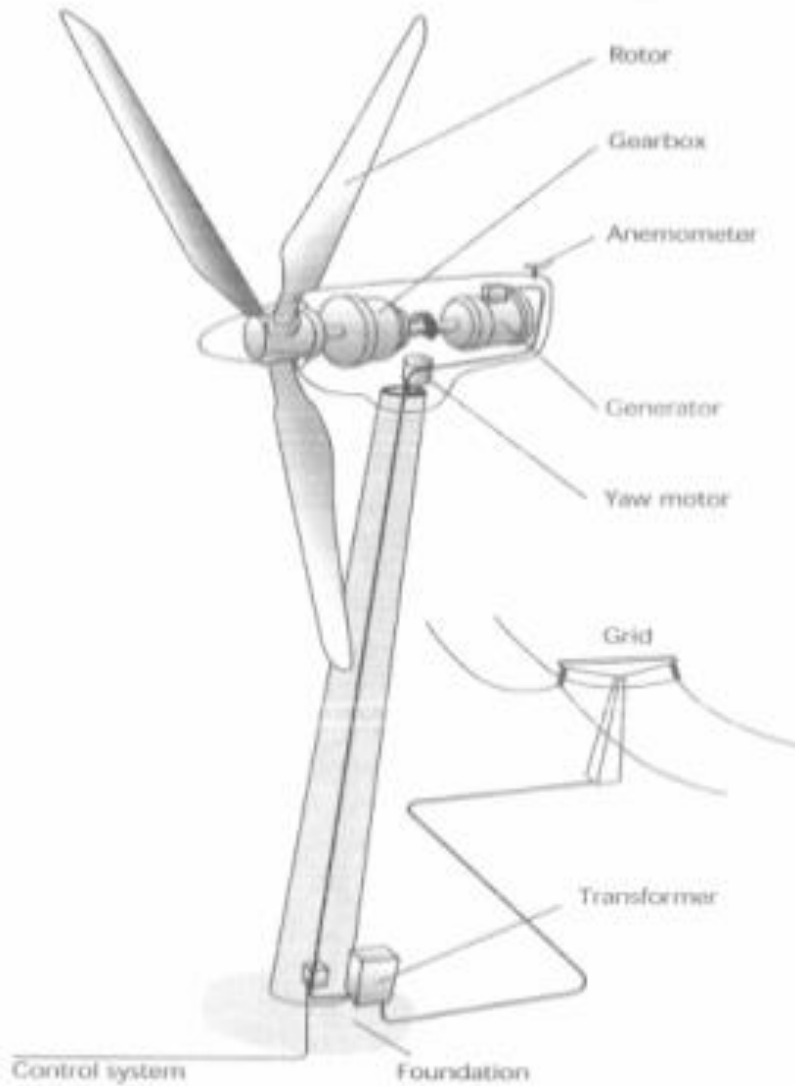


Figure 2-4: Component of a Wind Turbine.

2.4.1 Typical Phases of a Wind Farm Development

Typically, the development of wind farm is divided into three phases, namely:

- Pre-feasibility
- Feasibility
- Implementation

Each of the above-mentioned phases is described in detail in sections that follow. Some of these tasks occur in parallel to the EIA process.

1. Pre-feasibility

During the pre-feasibility phase, several early-stage assessments and surveys are typically undertaken by the proponent and other relevant specialists to determine if there exist any evident issues surrounding the proposed project and location. In order to progress to the next stage, the proponent should be confident that there are no obvious issues or impacts that may hinder the progress of the project and the final authorisation of the proposed development (“red flags”). The early stage activities undertaken by the proponent to evaluate feasibility of the site includes the following:

- communicates with the local authorities and civil aviation authorities,
- identifies any local communities,

- performs wind resource evaluations based on existing or collected data,
- investigates grid connectivity options,
- conducts an environmental impact assessment,
- evaluates the logistical and transportation routes, and
- considers power procurement options and project phasing requirements.

2. Feasibility

During the feasibility phase the proponent will carry out thorough investigation to establish the costs and economic viability of the project through designing a financial model (sometimes in cooperation with financial institutions); verify wind resources by conducting onsite measurements; ensure that the grid connection is economical and feasible within the proposed timeframes of the project; and identify any possible off-takers for the electricity output (in this case, the proposed project intends to be submitted to the REIPPPP for selection as a preferred bidder). It is necessary to erect a wind measurement mast(s) to gather wind speed data and to correlate these measurements with other meteorological data in order to produce a final wind model of the proposed project area.



Figure 2-5: An example of a meteorological mast.

A measurement campaign of at least 12 months is necessary to ensure verifiable data is obtained. The project proponent has already installed a number of masts in the area surrounding the project area and has commenced with the data capturing campaign. This data will advise on the economic feasibility of the project and inform the final layout of the wind turbine positions. The masts are a typically guyed lattice towers (or other forms), designed specifically for wind resource measurements. The masts are 'marked' as per the requirements of the Civil Aviation Authority.

The proponent will identify the order in which the project tasks will take place, including construction, operational and decommissioning phases, however the timeline will only be finalised once the project is a Preferred Bidder, if selected. Conditional on the outcome of the REIPPPP, if the applicant is selected as a preferred bidder the project will then commence.

3. Implementation

Apart from the feasibility and planning stage, the lifecycle of a wind farm can be divided into four phases namely:-

- (i) Preliminary civil works
- (ii) Construction
- (iii) Operation
- (iv) Decommissioning

Each of the above-mentioned phases are described in detail below.

(i) Preliminary civil works

Prior to the commencement of the main construction works, the Contractor may undertake vegetation clearance (if required) and site establishment works. The site establishment works may include the construction of one, or more, temporary construction compounds (camps) and laydown areas and the connection of services such as power and water to these compounds.

(ii) Construction phase

The following occurs prior to or during the construction stage of approximately 18-24 months:

a) *Geotechnical studies and foundation works*

A geotechnical study of the area is undertaken for safety purposes. This is commonly undertaken prior to construction phase and comprises of drilling, penetration and pressure assessments. For the purpose of the foundations, approximately 1500m³ of soil would need to be excavated for each turbine. These excavations are then filled with steel-reinforced concrete (typically 45 tons of steel reinforcement per turbine including a “bolt ring” to connect the turbine foundation to the turbine tower). Foundation design will vary according to the type and quality of the soil.

b) *Establishment of hard standing surfaces and laydown areas*

Laydown and storage areas will be required for the contractor’s construction equipment and turbine components on site.

c) *Site preparation*

If not carried out in the preliminary works phase, this will include clearance of vegetation over the access roads, platforms, lay-bys, substation and any other laydown or hard-standing areas. These activities will require the stripping of topsoil which will be stock-piled, back-filled and/or spread on site.

d) *Establishment of substation and ancillary infrastructure*

The establishment of these facilities/buildings will require the clearing of vegetation and levelling of the development site and the excavation of foundations prior to construction. A laydown area for building materials and equipment associated with these buildings will also be required.

e) *Turbine construction*

Weather permitting; the erection of the turbines can be completed swiftly and erection rates generally average 1-2 turbines per week. This phase is the most complex and costly.



Figure 2-6: Concrete pouring of a turbine foundation – note the tower base collar in the foreground.

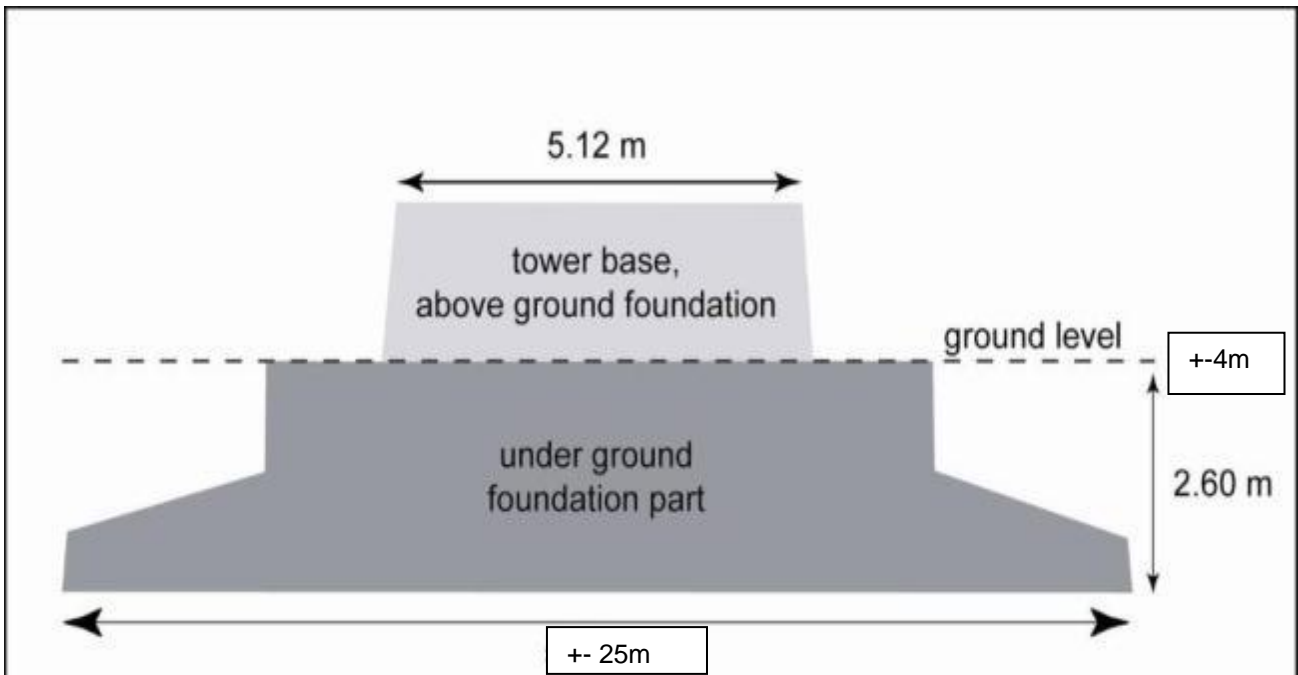


Figure 2-7: Indicative dimensions for the foundation of a 3MW/100m high wind turbine.



Figure 2-8: Assembly and erection of the tower sections using cranes.

f) Electrical connection

Each turbine is fitted with its own transformer that steps up the voltage usually to 22 or 33kV. The entire WEF is then connected to the “point of interconnection” which is the electrical boundary between the WEF and the municipal or national grid. This is done by the IPP as part of the REIPPPP. The high voltage and grid components are ceded to be owned by Eskom.

g) Electrical cabling

Electrical and communication cables are laid in trenches which run alongside the access roads as much as possible. All previous farming activities can continue unhindered on the ground above the cables during the operational phase.

h) Undertake site remediation

Once construction is completed and all construction equipment is removed, the site will be rehabilitated where practical and reasonable. On full commissioning of the facility, any access points to the site which are not required during the operational phase will be closed and rehabilitated.

(iii) Operational phase

During the operational phase of approximately 20 years in line with a typical power purchase agreement with Eskom, on-site human activity drops to a minimum, and typically includes routine maintenance requiring only light vehicles to access the site. On-going environmental monitoring may also require on-going access to the project area. Only major breakdowns or refurbishment would necessitate the use of cranes and trucks.

(iv) Decommissioning phase, refurbishment and rehabilitation

The wind turbines are expected to have a lifespan of approximately 20 to 25 years (with

appropriate maintenance). The infrastructure would only be decommissioned once it has reached the end of its economic or technological life. If economically feasible and appropriate permitting obtained, the disassembly and replacement of the individual components with more appropriate technology/infrastructure available at the time may take place.

The decommissioning activities would comprise the disassembly and replacement of the individual components with more appropriate technology/infrastructure available at the time. This operation is referred to as 'facility re-powering'. However, if not deemed financially feasible, then the facility would be completely decommissioned which would include the following decommissioning activities.

- a) *Site preparation*
Activities would include confirming the integrity of the access to the site to accommodate the required equipment and the mobilisation of decommissioning equipment.
- b) *Disassemble all individual components*
The components would be disassembled and reused and recycled or disposed of in accordance with regulatory requirements.
- c) *Decommissioning plan*
A decommissioning plan will be compiled in accordance with best practice to ensure the implementation of rehabilitation of disturbed areas and decommissioning activities in the closure of the project.

3. ALTERNATIVES

According to Appendix 2(2) of the EIA Regulations (GN R. 982 of 2014), a Scoping Report must contain all the information necessary for a proper understanding of the process, informing all preferred alternatives, including location alternatives, the scope of the assessment, and the consultation process to be undertaken through the environmental impact assessment process, and must include –

- (h) a full description of the process followed to reach the proposed preferred activity, site and location within the site, including -
 - (i) details of alternatives considered;
 - (x) if no alternatives, including alternative locations for the activity were investigated, the motivation for not considering such; and
 - (xi) a concluding statement indicating the preferred alternatives, including the preferred location of the activity.

3.1 Reasonable and feasible alternatives

Alternatives should include consideration of all possible means by which the purpose and need of the proposed activity could be accomplished. The no-go alternative must, in all cases, be included in the assessment phase as the baseline against which the impacts of the other alternatives are assessed.

The determination of whether the preferred activity, site or site location is appropriate is informed by the specific circumstances of the proposed development and its environment.

“**Alternatives**”, in relation to a proposed activity, means different means of meeting the general purpose and requirements of the activity, which may include alternatives to -

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

There are two types of alternatives: Fundamental Alternatives and Incremental Alternatives (these were considered for the project).

3.2 Fundamental Alternatives

Fundamental alternatives are developments that are entirely different from the proposed project and usually involve a different type of development on the proposed site, or a different location for the proposed development.

3.2.1 Location alternative supplementary information

The project proponent has undertaken various extensive processes in order to determine and select the current site location namely Brandvalley wind farm (see Figure 2-1 for the project boundary). The process involved integrated feasibility assessments (including spatial, environmental and technical) using a combination of internal tools and external input from third party stakeholders such as consultants, landowners and authorities.

The project area selection process has been considered from the following perspectives:

- National – consideration of the potential development sites from various locations within the borders of South Africa, using predetermined criteria, including environmental, legislative and technical.
- Regional – determination of the suitability of positioning of the site within a chosen locality using evaluative spatial, technical and legal parameters.

- Local – detailed evaluation of factors that influence project feasibility and the optimal location of the project infrastructure within the site boundaries.

A detailed overview of the site selection process is provided below.

National Alternatives

The wind resource is the main determining factor of project success due to the highly competitive nature of the REIPPPP, however environmental and social considerations are also crucial to ensure sustainable development. The applicant therefore identified fourteen areas in South Africa that could potentially have significant wind resources. These areas were subjected to an environmental and social pre-feasibility assessment that was undertaken by CES during 2009. The high level assessment determined the significance of the environmental and socio-economic issues, potential fatal flaws and to rank the sites.

The pre-feasibility assessment considered the following key factors:

- Visual impact including proximity to scenic areas, sense of place, prevailing land use, areas of conservation or recreational use, topography, proximity to dense settlements and shadow flicker;
- Noise/ acoustic considerations including proximity to existing ambient noise sources and settlements;
- Impacts to avifauna (birds) and bats based on proximity to important bird areas, migratory routes and local bird and bat data;
- Terrestrial ecology (fauna and flora) assessed in terms of local species and biomes;
- Hydrology impacts in terms of the presence of wetlands and surface water features, potential alterations to watercourses and the associated permit requirements;
- Heritage impacts to local heritage features;
- Road access and power line servitudes;
- Potential safety impact considerations; and
- Proximity to airfields in terms of the restrictions imposed by Civil Aviation Authority (CAA) Regulations.

The pre-feasibility assessment determined that two sites namely Swellendam 2 and Uitvlugt are potentially fatally flawed as indicated in Table 3-1. Although the other sites had various areas of concern/ risk² they were not deemed fatally flawed from an environmental and social perspective.

² Extreme risk: Significant mitigatory actions required to reduce these risks and in some cases it may not be possible to mitigate. Major risk: These risks are of a serious nature, and without effective mitigation measures would be major hindrances to the project proceeding. Medium risk: These risks are of a less serious nature but still important, and need to be reduced to as low as reasonably possible for the benefit of the environment or social network affected. Minor risk: These risks are generally acceptable to the project and environment, and mitigation is desirable but not essential.

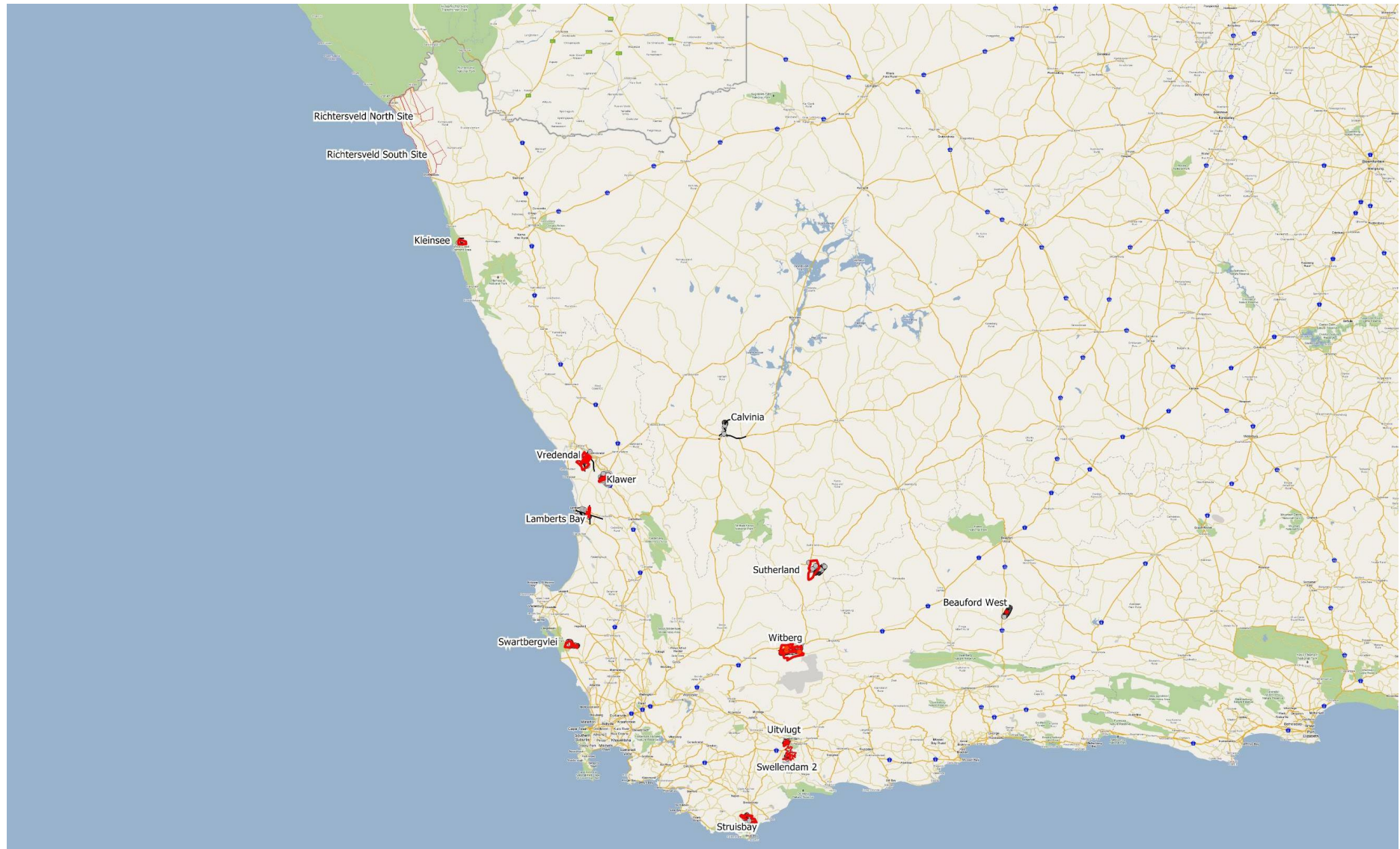


Figure 3-1: Overview map of the areas investigated in the pre-feasibility assessment and site selection process.

Table 3-1: Outcome of the environmental and social pre-feasibility assessment.

Overall Risk Categorisation											
<u>Site</u>	<u>Visual</u>	<u>Acoustic</u>	<u>Birds</u>	<u>Bats</u>	<u>Fauna</u>	<u>Flora</u>	<u>Hydrology</u>	<u>Heritage</u>	<u>Access</u>	<u>Safety</u>	<u>Fatally Flawed</u>
Kleinsee	Minor Risk	Minor Risk	Minor Risk	Major Risk	Minor Risk	Minor Risk	Minor Risk	Minor Risk	Minor Risk	Minor Risk	No
Richtersveld South	Medium Risk	Minor Risk	Medium Risk	Medium Risk	Minor Risk	Minor Risk	Minor Risk	Medium Risk	Minor Risk	Minor Risk	No
Richtersveld North	Medium Risk	Minor Risk	Medium Risk	Medium Risk	Minor Risk	Minor Risk	Minor Risk	Medium Risk	Minor Risk	Minor Risk	No
Lamberts Bay	Extreme Risk	Minor Risk	Medium Risk	Major Risk	Minor Risk	Minor Risk	Minor Risk	Minor Risk	Minor Risk	Minor Risk	No
Witberg	Medium Risk	Minor Risk	Major Risk	Major Risk	Minor Risk	Minor Risk	Minor Risk	Minor Risk	Medium Risk	Minor Risk	No
Beaufort West	Medium Risk	Minor Risk	Major Risk	Medium Risk	Minor Risk	Minor Risk	Medium Risk	Minor Risk	Minor Risk	Minor Risk	No
Sutherland	Minor Risk	Minor Risk	Major Risk	Major Risk	Minor Risk	Minor Risk	Minor Risk	Medium Risk	Medium Risk	Minor Risk	No
Vredendal	Extreme Risk	Minor Risk	Medium Risk	Major Risk	Minor Risk	Minor Risk	Minor Risk	Medium Risk	Minor Risk	Minor Risk	No
Calvinia	Medium Risk	Minor Risk	Minor Risk	Major Risk	Medium Risk	Medium Risk	Minor Risk	Minor Risk	Minor Risk	Minor Risk	No
Klawer	Extreme Risk	Minor Risk	Medium Risk	Major Risk	Minor Risk	Minor Risk	Medium Risk	Minor Risk	Minor Risk	Minor Risk	No
Struisbay	Major Risk	Minor Risk	Extreme Risk	Extreme Risk	Minor Risk	Minor Risk	Minor Risk	Minor Risk	Minor Risk	Major Risk	No
Swartbergvlei	Extreme Risk	Major Risk	Extreme Risk	Extreme Risk	Minor Risk	Medium Risk	Minor Risk	Minor Risk	Minor Risk	Major Risk	No
Uitvlugt	Extreme Risk	Minor Risk	Extreme Risk	Extreme Risk	Minor Risk	Medium Risk	Minor Risk	Minor Risk	Minor Risk	Minor Risk	Potentially
Swellendam 2	Extreme Risk	Extreme Risk	Extreme Risk	Major Risk	Minor Risk	Medium Risk	Minor Risk	Minor Risk	Minor Risk	Medium Risk	Potentially

The applicant proceeded to assess the remaining twelve sites to determine technical feasibility, including:

- Wind resource: Analysis of publicly available information, proprietary information and specialist on-site analysis of weather data to determine the wind resource.
- Site extent to ensure that sufficient land can be secured under long-term lease agreements to allow for a minimum number of wind turbines to make the project feasible.
- Grid access: Grid access and the distance to a viable connection point were key considerations in terms of prioritising appropriate sites. Ease of access into the Eskom electricity grid is vital to the viability of a wind facility. Projects which are in close proximity to a connection point and/or demand centre are favourable, and reduce the losses associated with power transmission.
- Land suitability: The current land use of the site properties was an important consideration for site selection in terms of limiting disruption to existing land use practices. Agricultural land was preferred as the majority of farming practices can continue in tandem to the operation of the wind farm once the construction and commissioning of the project is complete. Sites that facilitate easy construction conditions (relatively flat, limited watercourse crossings, lack of major rock outcrops) were also favoured during site selection.
- Proximity to aerodromes: The proximity to aerodromes and possible interactions with these facilities was considered as part of site selection.
- Landowner support: The selection of sites where the landowners are supportive of the development of renewable energy is essential for ensuring the success of the project.

Table 3-2: Technical considerations of the sites assessed to be environmentally feasible sites.

Overall Risk Categorisation		
Site	Go / No-go (not necessarily the <i>status quo</i>)	Motivation
<u>Kleinsee</u>	<u>This project was considered a no-go.</u>	<u>The Kleinsee mining area where this site is located was subjected to a tender for land rights with conditions seen technically and financially unfeasible to the developer.</u>
<u>Richtersveld South</u>	<u>This project was considered a no-go.</u>	<u>Unfavourable wind conditions.</u>
<u>Richtersveld North</u>	<u>The applicant proceeded with the development of this site.</u>	<u>All technical and environmental pre-screenings seemed to be favourable.</u>
<u>Lamberts Bay</u>	<u>The applicant proceeded with the development of this site.</u>	<u>All technical and environmental pre-screenings seemed to be favourable. Further wind resource evaluation showed that the site had low wind resources.</u>
<u>Witberg</u>	<u>The applicant proceeded with the development of this site.</u>	<u>All technical and environmental pre-screenings seemed to be favourable.</u>
<u>Beaufort West</u>	<u>This project was considered a no-go.</u>	<u>Unfavourable wind conditions</u>
<u>Sutherland</u>	<u>This project was considered a no-go.</u>	<u>Unfavourable wind conditions</u>
<u>Vredendal</u>	<u>This project was considered a no-go.</u>	<u>High environmental risk and less favourable wind conditions</u>
<u>Calvinia</u>	<u>This project was considered a no-go.</u>	<u>Limited space and grid connection options for a feasible wind farm.</u>
<u>Klawer</u>	<u>The applicant proceeded with the development of this site.</u>	<u>All technical and environmental pre-screenings seemed to be favourable.</u>

Overall Risk Categorisation		
Site	Go / No-go (not necessarily the <i>status quo</i>)	Motivation
<u>Struisbay</u>	<u>This project was considered a no-go.</u>	<u>High environmental risks in terms of birds and bats.</u>
<u>Swartbergvlei</u>	<u>This project was considered a no-go.</u>	<u>High environmental risks in terms of birds and bats.</u>

These initial pre-feasibility assessments assisted G7 with forthcoming decisions as to which site alternatives to be prioritised for the development of wind energy facilities. Even though the Roggeveld area per se was not included in this national assessment, the Sutherland site was taken as a proxy regarding environmental risks before environmental impact assessment processes commenced in mid-2010. The final environmental impact assessment report and resulting environmental authorisation in 2014 confirmed that the area had comparatively low environmental sensitivities and that bird and bat risks were actually lower than originally thought for Sutherland.

In addition, the DEA's strategic environmental assessment (SEA) for wind and solar farms identified an area of about 160x60km, centred on Eskom's Komsberg substation, as one of only a few priority areas for wind farm development in South Africa. The SEA itself is based on a large number of environmental and technical criteria and therefore supports the applicant's findings.

Regional Alternatives

Apart from the sites described in Table 3-2, the applicant also proceeded with researching the greater Roggeveld area. An environmental impact assessment (EIA) process commenced in mid-2010 for a 750MW WEF. Before completing the process, DEA requested that separate EIA processes be undertaken for each 140MW WEF in accordance with the maximum generation capacity per WEF as stipulated under the Department of Energy's Renewable Energy Independent Power Producer Procurement Programme (REIPPPP). The original 750MW project was therefore divided into various phases, each with a potential to generate 140MW.

The detailed EIA done as part of the earlier 750MW project Roggeveld lead the developer to believe that there is an acceptable risk of environmental impacts by wind farms in this area. Based on high quality wind measurements conducted since 2010, the wind resource in this area also proved to be exceptionally high, further evidenced by the first phase's ability to bid the lowest tariff (R0.56/kWh) of all wind farm projects in round 4 of the REIPPPP in August 2014. Advanced 3-dimensional wind modelling conducted for an area about 25km around the first phase showed that the surrounding terrain (which includes the Brandvalley site) held very similar, if not better wind potential and therefore was considered to be feasible for further wind farm development.

A number of possible 140MW phases were investigated further. Phase 2, now the Karreebosch wind farm, lies north of the Roggeveld wind farm (phase 1) and obtained environmental authorisation in January 2015. Another two phases, 3 and 4, now referred to as the Brandvalley and Rietkloof wind farms respectively, are currently undergoing their environmental impact assessment process.

As an alternative, a fifth phase located immediately southwest of the current Brandvalley project site was considered for potential project development, but was considered no-go for wind farm development for reasons described below.

Phase 5 alternative

Phase 5 consisted of the properties immediately southwest of Brandvalley, up to about 13km away where the terrain falls off into the southern tips of the comparatively flat Tankwa Karoo. According

to the applicant's wind map this region exhibits even better wind resources than phase 1 (Roggeveld Wind Farm) due to the presence of many elongated mountain ridges which are ideally exposed to the prevailing wind directions. The area was also expected to have similar ecological sensitivities to Roggeveld due to the comparable biophysical environment.

However, this alternative proved infeasible due to the fact that none of the affected landowners were open to the idea of wind energy development on their properties. All further assessments and investigations therefore did not progress any further.

Local alternatives

The main project components are the wind turbines themselves which inform the layout of associated infrastructure such as roads, crane pads, substation positions or power lines. Within the Brandvalley area, detailed consideration was given to selecting areas that would be suitable for turbine placement or project infrastructure. In the selection process some alternative areas were eliminated for the following reasons:

Wind resources

An extensive wind measurement campaign has been undertaken for the greater Roggeveld area for over five years which, together with short duration wind data from 80m masts on site, was used to compute a high resolution wind map for the Brandvalley study area to inform the turbine placement within. An overview of the wind resources (red= high, yellow = average, green/blue = low) measured and modelled for Brandvalley site (red dotted line), the demarcation of the buildable areas (black polygons mainly around the ridge tops) and the 70 selected most feasible turbine positions are indicated in the in the Figure 3-2 below.

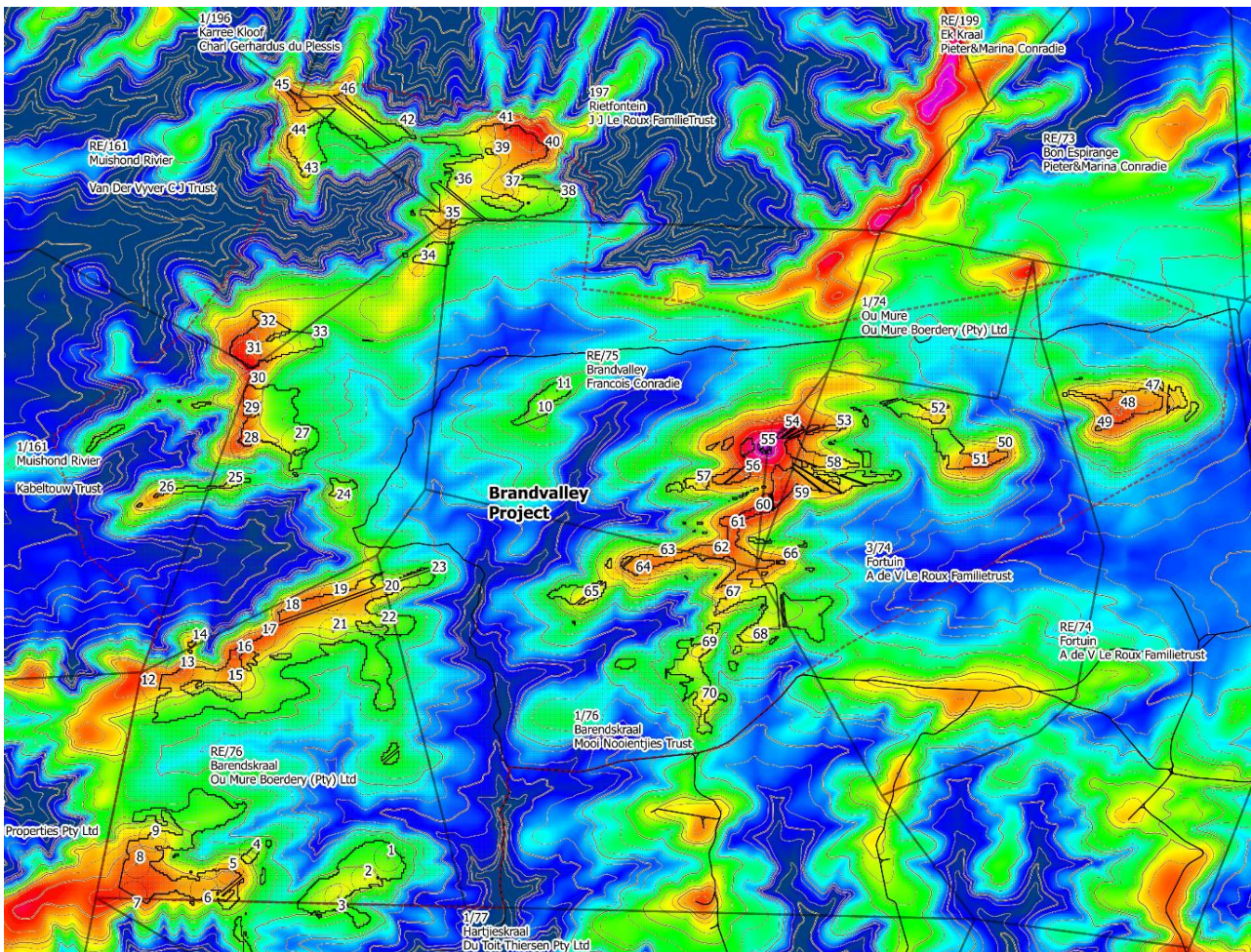


Figure 3-2: Overview of wind resources measured and modelling for the Brandvalley WEF.

In order to ensure that a project has a good chance of being constructed in the highly competitive REIPPPP market, wind turbines must be placed in the areas with the highest wind resources. Typically, ridgelines prove most suitable in this respect due to flow acceleration effects which occur in such exposed spots and no wind shading from surrounding hills. Average wind speeds in the valleys between tend to be very low for the opposite reasons.

However, within the ridge systems present on site, some of them do not show the expected high wind resources due to lower exposure (shorter and/or smaller slopes upwind) at these locations. This can also be caused by wind shading caused by neighbouring ridgelines or unfavourable predominant wind direction compared to the topographical layout of a location, although their wind potential is still higher than any position in the valleys.

As indicated in Figure 3-2, the southeast corner and the northern section, certain ridges to the have medium or high wind resources, but were disqualified as potential alternatives for turbine placement either because they were not within a “buildable area” or as a result of landowner input as explained below.

Buildable Areas

Buildable Areas are custom defined areas based on all preliminary technical and environmental parameters (before EIA and in-depth technical studies) which demarcate where turbine placement is feasible and exclude areas where not. They are based on maximum allowable slopes, setbacks from farmsteads, setbacks from neighbouring farms required by provincial land use regulations and finally required buffers from Eskom power lines. In addition, the process of identifying buildable areas takes into account certain no-go zones to avoid potential electromagnetic interference on existing telecommunication infrastructure.

The buildable areas for the Brandvalley Wind Farm exclude high slopes of more than 8 degrees for civil and electrical engineering design and environmental reasons (due to sensitive vegetation on slopes), erosion control and slope stability. Setbacks of 3 times tip height from existing Eskom transmission lines (400kV and 765kV) were applied. All direct point to point links of telecommunication providers available at the time of the application were buffered adequately to avoid potential risk of interference. These included the providers Eskom, Telkom, Sentech, Transnet, Cell C, MTN, Vodacom and Breede Net who have facilities in the area. The providers are part of the I&AP list and are therefore not only informed of the development, but also have the chance to comment in case there are any issues.

In terms of the applicable Zoning Scheme regulations in the Western Cape, renewable energy projects may be granted a Consent Use on an Agriculture Zone when an application has been submitted to the relevant municipality. One of the key parameters for wind turbine placement is that the structure must be positioned at a distance of 1.5 times tip height (from foundation to tip of the blade). This parameter was applied to positioning all the turbines from the outer boundaries of the project properties.

Landowner input

The project proponent and the landowners entered into negotiation for a long-term lease agreement for the land to be used for project development. During these discussions, the landowners had the opportunity to state preference for certain areas of their properties to be excluded from the development. The applicant also consulted with the landowners during the conceptualisation phase to discuss the site development plans. The landowners, in turn, expressed a preference for certain infrastructure to be placed at different locations within their properties. This meant that some areas of potential development would be excluded due to landowner preferences. In case of this Brandvalley project, alternative positions for siting of infrastructure had to be considered in light of landowner input.

3.2.2 Access road alternatives

Two access road alternatives were identified during the preliminary design of the wind farm namely:

- Access road alternative 1 is proposed to start from the R354 and follow the existing gravel road to a western direction. Various side roads branch from this main access road in all directions order to connect the various ridges where turbines are proposed to the main access road.
- Access road alternative 2 is south of alternative 1 and is also proposed to start from the R354 and follow an existing farm access road in a western direction. From this alternative main access road various roads will branch to north, west and east directions.

Please note that the main access road sections i.e. the point of access from the R354 and a short road section are the main difference between the two alternatives as the turbine roads branching to connect the ridges will be assessed in both access road alternatives. Please see Figure 3-3 for the layout of access road alternative 1 and access road alternative 2.

Each road section will be buffered by 200m in order to allow for incremental alternatives i.e. reroute within the buffer in order to avoid any sensitive features that could be identified during the detailed specialist assessments and civil designs.

Table 3-3: Advantages and disadvantages of proposed road alternatives.

<u>Alternative</u>	<u>Advantages</u>	<u>Disadvantages</u>
<u>Access road alternative 1</u>	<u>Access road alternative 1 follows the existing road which could be upgraded.</u>	<u>TBC based on findings of detailed specialist assessments.</u>
<u>Access road alternative 2</u>	<u>Access road alternative 2 follows the existing road which could be upgraded.</u>	<u>TBC based on findings of detailed specialist assessments.</u>

Currently, there’s an equal preference for the identified alternatives. The preferred alternative will be informed by the detailed specialist assessments and the outcome of the public consultation process.

3.2.3 Construction camps

Potential areas for the establishment of a construction camp were identified through considering large areas with a slope less than 2 degrees and a site extent of up to 10ha. Areas steeper than that, might require blasting or levelling to establish a suitable area and areas smaller than that might be too small. Input from landowners were obtained to further guide the identification of suitable construction camp locations.

Three construction camp alternatives layouts will be assessed during the EIA phase namely:

- Construction camp alternative 1 located adjacent and to the south of the point where access road alternative 1 connects to the R354.
- Construction camp alternative 2 is located adjacent to a proposed secondary access road immediate north of the centre of the facility.
- Construction camp alternative 3 is located immediate west of the centre of the facility adjacent to a secondary access road.

Please see Figure 3-3 for the proposed construction camp locations.

Table 3-4: Advantages and disadvantages of construction camp alternatives.

<u>Alternative</u>	<u>Advantages</u>	<u>Disadvantages</u>
Construction camp alternative 1	Construction camp alternative 1 is located east of the R354 which would ease the offloading of turbine components and other deliveries. The area is very flat, large in extent, along a public road.	TBC based on findings of detailed specialist assessments. Additional security measures would be required. Potential visibility from the R354, but this will be temporary in nature and be investigated by the visual specialist.
Construction camp alternative 2	Construction camp alternative 2 has good accessibility from the R354 via the existing road to be upgraded. The area is flat, large in extent, and more or less in the centre of the facility.	TBC based on findings of detailed specialist assessments.
Construction camp alternative 3	Construction camp alternative 3 has good accessibility. The area is flat, large in extent, and more or less in the centre of the facility.	TBC based on findings of detailed specialist assessments.

Currently, there's an equal preference for the identified alternatives. The preferred alternative will be informed by the detailed specialist assessments and the outcome of the public consultation process.

3.2.4 Substation location alternatives

Four identified substation positions were based on a technical study to limit overall line length of internal park cabling and losses based on different turbine layouts (40-70 turbines depending on generator size), economic and environmental optimisation with cutting down number of electrical strings and cable trenches, slope analysis of suitable positions for earthworks and levelling and optimised 132kV line routing. Four substation location alternatives were identified during preliminary designs for assessment during the EIA phase:

- Substation alternative 1 is proposed adjacent and to the south of the main access road alternative 1 approximately 2.7km from the R354.
- Substation alternative 2 is proposed adjacent and to the south of a secondary road extending from the main access road alternative 1.
- Substation alternative 3 is proposed adjacent to a secondary road north-east from the centre of the facility.
- Substation alternative 4 is proposed adjacent to a secondary road in close proximity to construction camp alternative 3.

Please see Figure 3-3 for the proposed substation locations.

Table 3-5: Advantages and disadvantages of proposed substation alternatives

<u>Alternative</u>	<u>Advantages</u>	<u>Disadvantages</u>
Substation alternative 1	Substation alternative 1 will have great access from the R354.	TBC based on findings of detailed

<u>Alternative</u>	<u>Advantages</u>	<u>Disadvantages</u>
		<u>specialist assessments. Potential visibility from the R354, but this will be temporary in nature and be investigated by the visual specialist.</u>
<u>Substation alternative 2</u>	<u>Substation alternative 2 will have great access from the R354, with limited if any visual impact to the R354.</u>	<u>TBC based on findings of detailed specialist assessments.</u>
<u>Substation alternative 3</u>	<u>Substation alternative 3 will have close access to most turbine positions which will require shorter lengths of 33kV electrical infrastructure.</u>	<u>TBC based on findings of detailed specialist assessments.</u>
<u>Substation alternative 4</u>	<u>Substation alternative 4 is very central with close access to most turbine positions.</u>	<u>TBC based on findings of detailed specialist assessments.</u>

Currently, there is an equal preference for the identified alternatives. The preferred alternative will be informed by the detailed specialist assessments and the outcome of the public consultation process.

3.2.5 Technology Alternatives

Various technology alternatives to wind energy were deemed inappropriate for the site based on the following in addition to the motivation provided in Chapter 4:

- solar energy developments require areas with high solar radiation and large, flat terrain. However, the site is very hilly with prominent ridgelines with slopes that are unsuitable for large photovoltaic or solar concentrator arrays. In addition, areas much further north in the Northern Cape have much higher solar irradiation values than the Karoo as the latter suffers from frequent winter and summer cloud cover;
- the site is very dry with slow growing, sparse vegetation unsuitable for a biomass or biogas project;
- there is no coal deposits in the region suitable for a coal fired power station;
- there is not enough water available for the cooling requirements of a nuclear power station; and
- the exact quantity, location and economic recoverability of shale gas resources are still very uncertain in the Karoo, apart from the risks of contaminating underground aquifers through hydraulic fracturing activities. A gas fired power plant is therefore also not feasible in this area.

Therefore, no technology alternatives are feasible for assessment at this stage of the project other than a wind energy facility.

Please also see Chapter 4 for the project need and desirability supporting the technology alternative.

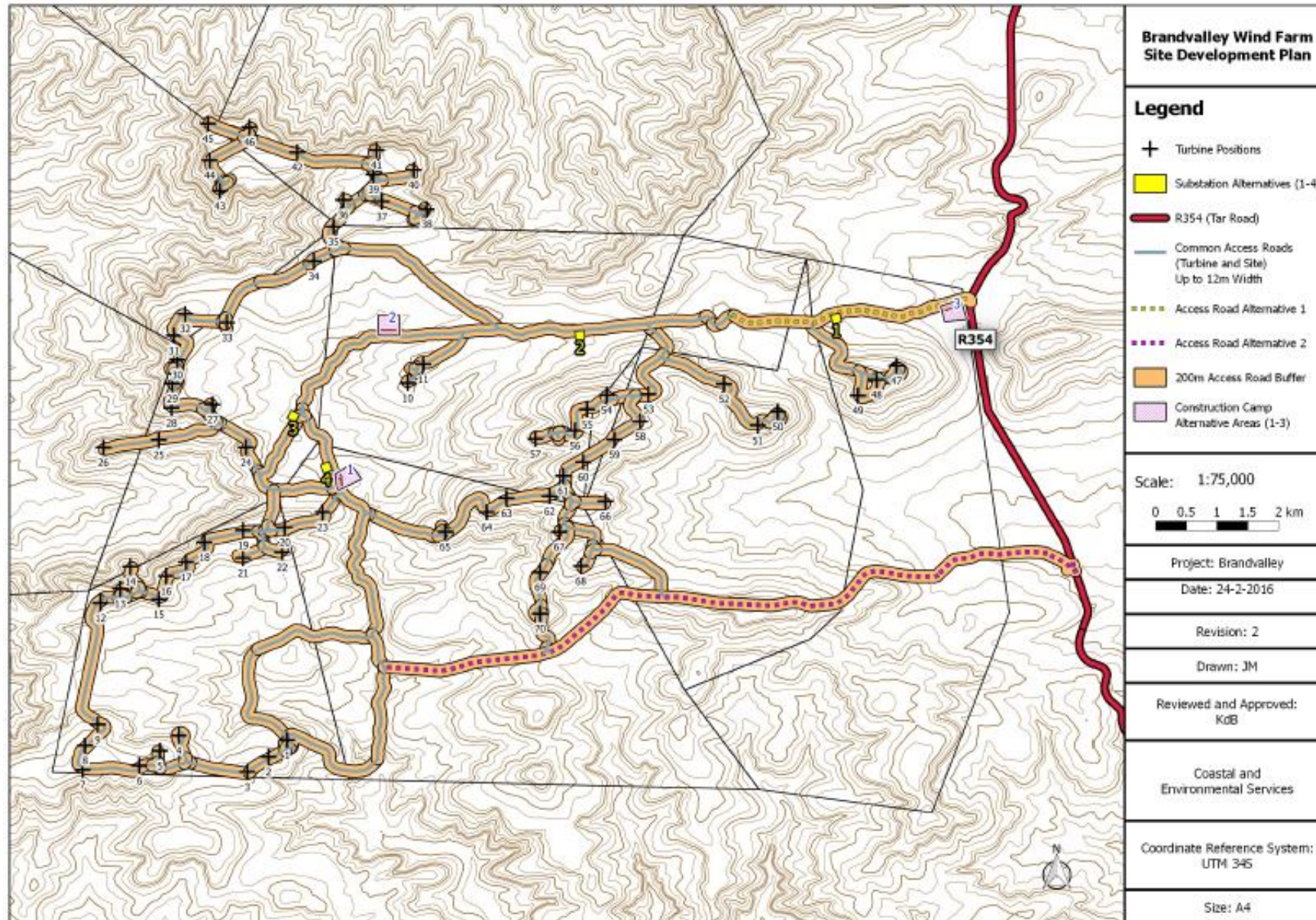


Figure 3-3: Conceptual Layout inclusive of construction camp, access road, substation alternative and turbine positions.

3.3 Incremental Alternatives

Incremental alternatives are modifications or variations to the design of a project that provide different options to reduce or minimise environmental impacts. Turbine layout is considered to be an incremental alternative.

3.3.1 Turbine Layout Alternatives

Three farm portions currently overlap with both Brandvalley with Rietkloof as indicated in Figure 3-4 below.

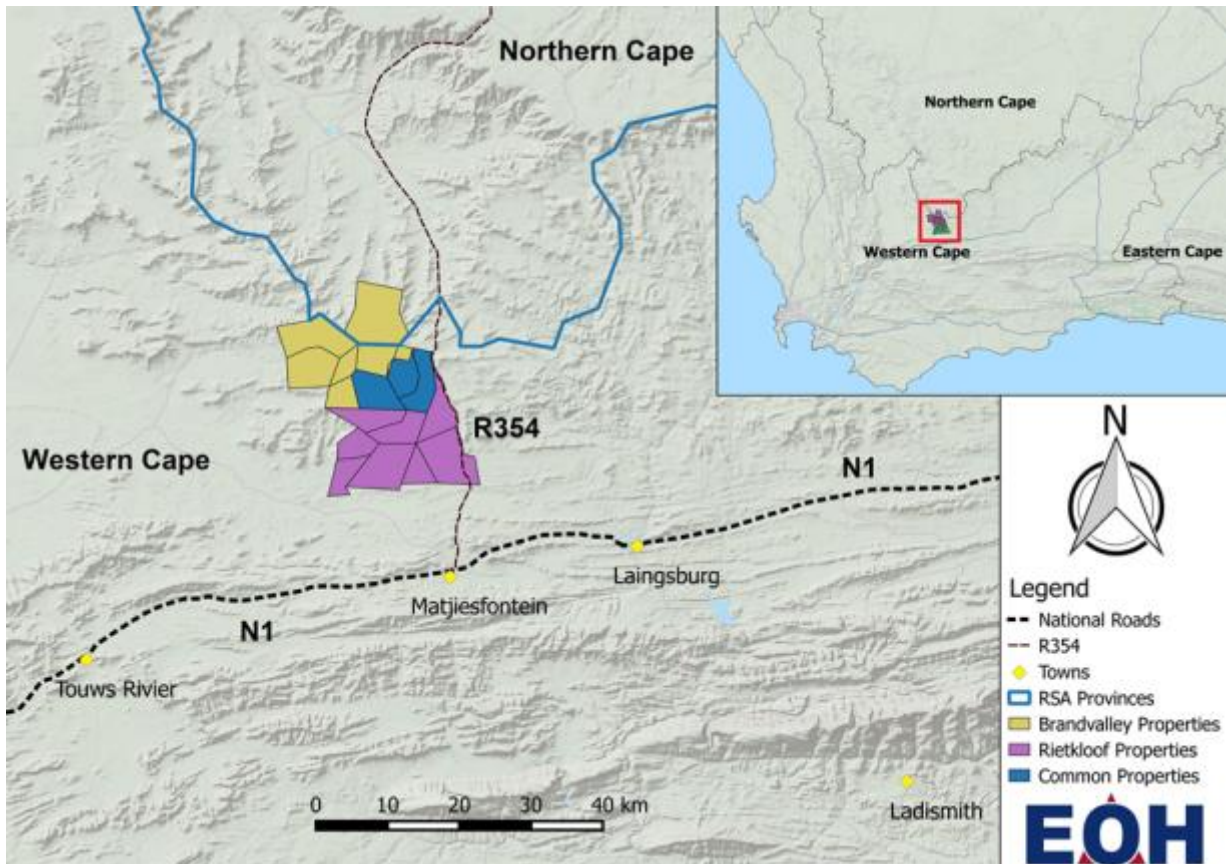


Figure 3-4: Overlapping properties for the proposed Brandvalley and Rietkloof projects.

The detailed specialist assessments, on-going bird and bat monitoring campaigns and comments from interested and affected parties may identify no-go development zones, which likely are to be recommended to be excluded from the Brandvalley layout site areas. Therefore, incremental alternatives to be considered in the EIA Phase include alternative turbine positions.

3.4 No-Go Development

It is mandatory to consider the “no-go” option in the EIA process. The no development alternative option assumes the site remains in its current state, i.e. there is no construction of a WEF and associated infrastructure in the proposed project area. The no-go alternative will be assessed in an objective manner in the EIA Phase.

3.5 Summary of Alternatives

The above sections describe the alternatives considered in the Scoping Phase and the reasons for selecting the following alternatives for consideration in the EIA Phase:

1. Fundamental alternatives:

- 1.1 Project area location alternative: One project location alternative namely Brandvalley Wind Farm.
- 1.2 Access road location alternatives: two access road alternatives namely access road alternative 1 and access road alternative 2.
- 1.3 Three construction camp alternatives.
- 1.4 Four onsite substation location alternatives.
- 1.5 Technology alternative: One technology alternative namely a WEF.
2. Incremental alternatives:
 - 2.1 Turbine layout alternatives.
 - 2.2 200m buffer on access roads for sensitivity alternatives.
3. No-go alternative.

4. PROJECT NEED AND DESIRABILITY

In terms Appendix 2(2) of the EIA Regulations (GN R. 982 of 2014), a Scoping Report must contain all the information necessary for a proper understanding of the process, informing all preferred alternatives, including location alternatives, the scope of the assessment, and the consultation process to be undertaken through the environmental impact assessment process, and must include –

(f) A motivation for the need and desirability for the proposed development including the need and desirability of the activity in the context of the preferred location.

4.1 Introduction

Increasing pressure is being placed on countries internationally to reduce their reliance on fossil fuels, such as oil and coal, which contribute towards greenhouse gases being emitted into the atmosphere and thus to climate change. Most of South Africa's energy comes from non-renewable sources like coal, petroleum, natural gas, propane, and uranium. Currently, fossil fuels supply 90% of South Africa's energy needs with demands on energy supply increasing by 3.5% in the next 20 years. By the end of June 2015, 37 independent power producers commenced with commercial operation, adding 1,860MW capacity to the power system with equates to 4% of the total installed capacity in South Africa (Department of Energy, 2015). The South African Government recognises the need to diversify the mix of energy generation technologies within the country and to reduce the country's reliance on fossil fuels which contribute towards climate change. and are therefore the purpose is to move towards an energy mix that gradually shift away from generation technologies that are not environmentally friendly. To address the need for generation capacity from renewable energy technologies, the various planning and policy documents were developed in line with international conventions as described below.

International conventions, national plans and programmes as well as the relevant Integrated Development Plans (IDP), Spatial Development Frameworks (SDF), Environmental Management Frameworks (EMF) and Strategic Environmental Assessments (SEA) were taken into account in assessing the development in a spatial context.

4.2 Need

4.2.1 International

In accordance with the prescriptions of the **United Nations Convention on Climate Change, 1994 (UNFCCC)** and its associated **Kyoto protocol of 1997** South Africa has put in place a long term mitigation scenario (LTMS) by which the country aims to develop a plan of action which is economically viable and internationally aligned to the world effort on climate change. During this period (2003-2050) South Africa will aim to take action to mitigate greenhouse gas emissions by 30% - 40% by the year 2050. This is a reduction of between 9000 and 17 500 tons of CO₂ by 2050. Consequently, the South African Government has set a target of 17GW renewable energy contribution to new power generation capacity by 2030 (IRP, 2011). This is to be produced from wind, solar, biomass, landfill gas and small-scale hydro facilities.

4.2.2 National

The **National Development Plan (NDP)** is aimed at reducing and eliminating poverty in South Africa by 2030. It promotes sustainable and inclusive development in South Africa, in favour of a decent standard of living for all. The proposed WEF fulfils 3 of the 12 key focus areas namely contributing to an economy that will create more jobs; improving infrastructure and transition to a low carbon economy. The NDP outlines the need for South Africa to increase production of electricity by 40,000 MW by 2030, 20,000 MW of this capacity has been proposed for production from renewable sources. The proposed project aims to be a contributor towards such target.

The proposed WEF, is in line with the **Integrated Energy Plan for the Republic of South Africa (2003)** commissioned by then Department of Minerals and Energy (now the Department of Energy) in response to the requirements of the National Energy Policy. The framework is intended to create a balance between energy demand and resource availability so as to provide low cost electricity for social and economic development, while taking into account health, safety and environmental parameters. This WEF would contribute to diversification of energy supply and the promotion of universal access to clean energy.

The **Integrated Resource Plan (IRP2010)** for South Africa illustrates a clear need for renewable energy projection. The IRP was initiated by the Department of Energy (DoE) and lays the foundation for the country's energy combination up until 2030, and seeks to find an appropriate balance between the expectations of different stakeholders considering a number of key constraints and risks, including the reduction of carbon emissions; security of supply; Southern African regional development and integration and localisation and job creation. The Policy-Adjusted IRP includes recent development prices and issues allocations of 17.8GW for renewable energies, of the total 42.6GW new-build up to 2030 distributed to wind (8.4GW), concentrated solar power (1.0GW) and photovoltaic (8.4GW).

Renewable Energy Independent Power Producer Procurement Programme (REIPPPP), aims to promote and procure electricity generated by the private-sector from renewable energy sources. DoE has placed a target of 10 000 Gigawatt hours (GWh) of renewable energy power generation for the country. The REIPPPP initially aimed to procure 3 725MW renewable energy by 2016, however in 2012 it was announced that an additional 3 200MW of renewable energy would be procured and in August 2015, this allocation further increased by a renewable energy generation capacity of 6 300 MW gazetted in a Ministerial determination (DoE, 2015). As demonstrated above there is a need for renewable energy in South Africa and the proposed Brandvalley Wind Farm aims, in part, to fulfil this need. If this project is deemed feasible, Brandvalley Wind Farm intends to bid this wind farm under the REIPPPP programme in order to supply the electricity generated to Eskom.

4.2.3 Local

Integrated Development Plans (IDPs)

IDPs for the Cape Winelands, the Namakwa and Central Karoo District Municipalities (2012 – 2016) are in accordance with the objectives of the National Development Plan (NDP), which encourage the generation of electricity through renewable energy and to reduce carbon-intensive electricity production. The proposed Brandvalley WEF is thus in line with the objectives of the IDPs for the municipalities in which it falls, as described in Table 4-1 below.

Table 4-1: District and Local Municipality Integrated Development Plans (IDPs) and relevance of the proposed project

Local Planning Guide	Relevance
Cape Winelands District Municipality (CWDM) IDP (2012/13-2016/17)	<i>The overarching vision and mission statement of the CWDM IDP promotes both sustainable development and job creation. The key stakeholder priorities highlighted in the strategic objectives includes the promotion of renewable energy projects. The IDP furthermore calls for an increase in employment opportunities through the green economy, and more specifically, through green energy initiatives.</i>
Central Karoo District Municipality (CKDM) IDP (2012-2017)	<i>The CKDM IDP promotes sustainability through the integration of social, economic and ecological components. The planning document highlights the increasingly importance of sustainable energy, emphasising the national vision to focus on renewable energy as a movement towards less carbon-intensive electricity production. The CKDM IDP and SDF make provision for wind farms within the Central Karoo as an alternative energy source.</i>
Namakwa District Municipality (NDM) IDP (2012-2016)	<i>The NDM commits to sustainable development and the transition to a low-carbon economy through the expansion of renewable energy. The IDP calls for the development and implementation of a Renewable Energy Strategy to achieved their infrastructure objectives. Although such a strategy is not in place, the establishment of a 140MW WEF are in line with the</i>

		<i>commitment to move towards a low-carbon economy by increasing renewable energy generation capacity.</i>
Witzenberg Municipality (2012/2017)	Local IDP	<i>The Witzenberg LM IDP promotes renewable energy and the management and use of natural resources as an opportunity to stimulate growth and achieve sustainable development. The environmental policy of the LM calls for environmental projects that ensure environmental sustainability and contribute to job creation. The Brandvalley WEF aims to be environmentally sustainable and to contribute to local job opportunities.</i>
Laingsburg Municipality IDP (2012/2017)	Local (LLM)	<i>The key strategies proposed by the LLM IDP within the Strategic Infrastructure and the Environmental and Spatial Development approaches include the support and promotion of wind, solar and bio-gas developments as a source of alternative energy.</i>
Karoo Local IDP (2015-2016)	Hoogland Municipality	<i>The mission statement of the Karoo Hoogland LM IDP is to provide leadership on environmental sustainability and climate change response. The Environmental and Spatial Analysis includes the promotion and diversification of renewable energy projects in accordance with the Integrated Resource Plan (IRP) for Electricity 2010-2030 in addition to the creation of job opportunities through the Green Economy.</i>

4.3 Desirability

4.3.1 Renewable energies

The conventional sources of energy generation, such as coal, oil and fuel, produce greenhouse gas (GHS) emissions associated with climate change. Globally, oil is the highest source of energy, followed by coal, which is the first source for power generation. South Africa is highly dependent on coal-fired power plants for electricity generation and supply. In response to the large percentage of household, industrial and commercial usage of fossil fuels, the NDP and SIPs described in section 4.2 above highlight the need to reduce reliance on carbon-intensive energy provisions and transition to a low carbon intensive economy. Renewable energy sources play an important role in this transition through the diversification of energy source, the provision of energy services in a sustainable manner, thus contributing to sustainable development, and the mitigation of climate change (DEA, 2015).

Wind is a renewable resource as it is abundant and inexhaustible. Wind energy generates electricity without the production of toxic pollution or carbon dioxide emissions and thus contributes to the transition to a low carbon-intensive economy.

There are, however, environmental impacts associated with the construction and operation of the wind energy facility. These impacts are identified in Chapter 7 of this report and are to be further assessed in the EIA Phase of the proposed project.

4.3.2 Sustainable development

Sustainable energy is defined as “energy which provides affordable, accessible and reliable energy services that meet economic, social and environmental needs within overall developmental context of society, while recognising equitable distribution in meeting those needs” (DEA, 2015). Sustainable energy is an element of sustainable development, defined as development that meets the needs of the people today without compromising the ability of future generations to meet their needs, which incorporates economic development, social development and environmental development.

Renewable energy developments are considered to contribute towards sustainable development, increasing access to electricity for both the current generation and for future generations, while additionally providing energy sources to commercial and industrial sectors to promote their economic competitiveness and future prosperity. Wind energy is a naturally generated and stable source of energy, contributing to the energy security and sustainable development and is thus in accordance with the country’s development goals.

4.3.3 Project location

The vast plains, the mountainous topography, the grid proximity and expected capacity as well as the predicted and confirmed wind resources contribute to the suitability of the Karoo, and the proposed location, for the development of WEFs for the generation of power to meet the renewable energy requirements for South Africa.

The Strategic Environmental Assessment (SEA) for wind and solar PV energy in South Africa (CSIR, 2013) supports of the Strategic Integration Project (SIP) 8 which focuses on the implementation of sustainable green energy initiatives. The SEA integrates environmental, economic and social factors to identify eight (8) Renewable Development Zones (REDZs). The REDZs identifies areas where large scale wind energy facilities can be developed in in a manner that limits significant negative impacts on the environment while yielding the highest possible socio-economic benefits to the country. The SEA process and the determination of the REDZs provides an opportunity for government authorities, the private sector and the public to provide input and agree on appropriate development areas. The REDZs additionally identifies priority areas for investment opportunities into the electricity grid, providing a solution to the current limitations of existing grid infrastructure and the challenges faces in expanding the grid.

The proposed Brandvalley WEF falls within the Komsberg Wind REDZ (Figure 4-1 and 4-2). The REDZs are considered areas of the highest development potential and on land that is technically available for wind and solar developments. Proposed projects that fall within these areas are thus incentivised and streamlined.

Cabinet approved the gazetting of REDZ on 17 February 2016³.

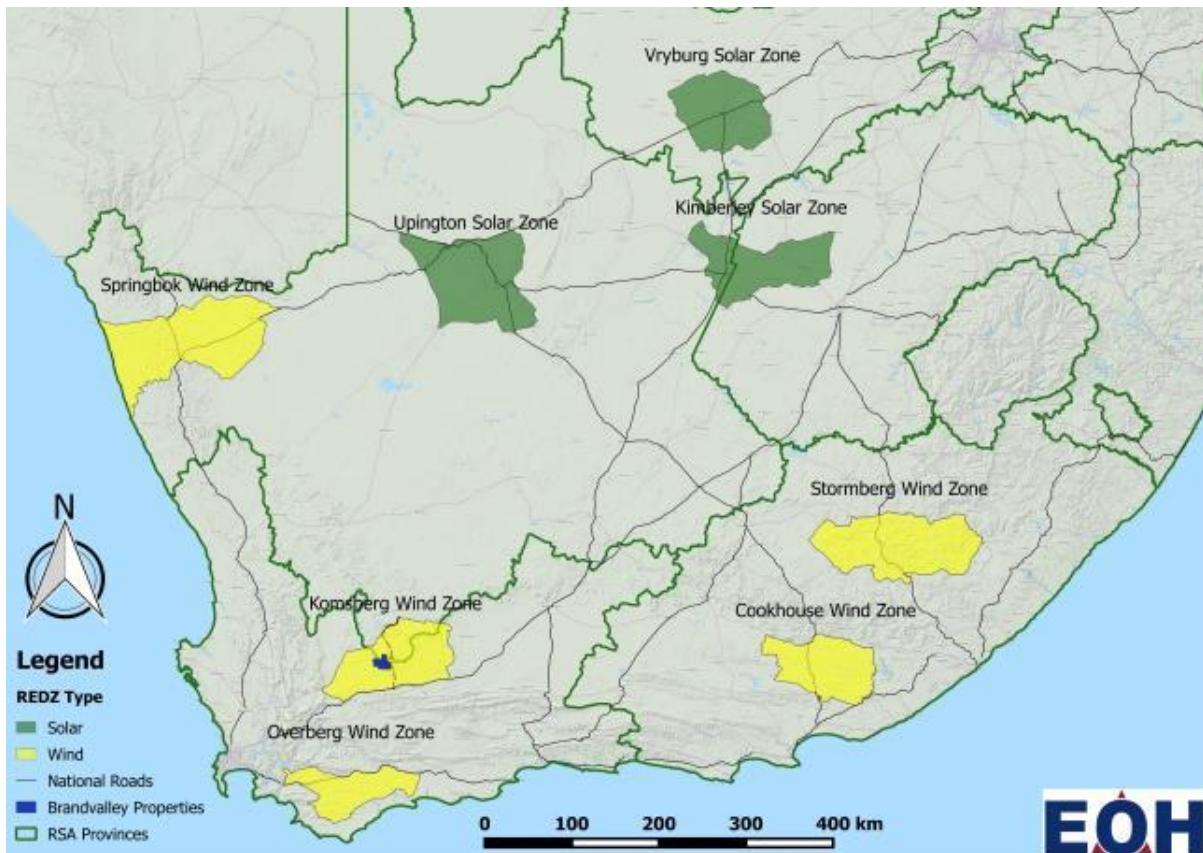


Figure 4-1: The proposed Brandvalley WEF project site in relation to the REDZs.

³ South African Government, 2016. <http://www.gov.za/speeches/statement-cabinet-meeting-17-february-2016-18-feb-2016-0000>.

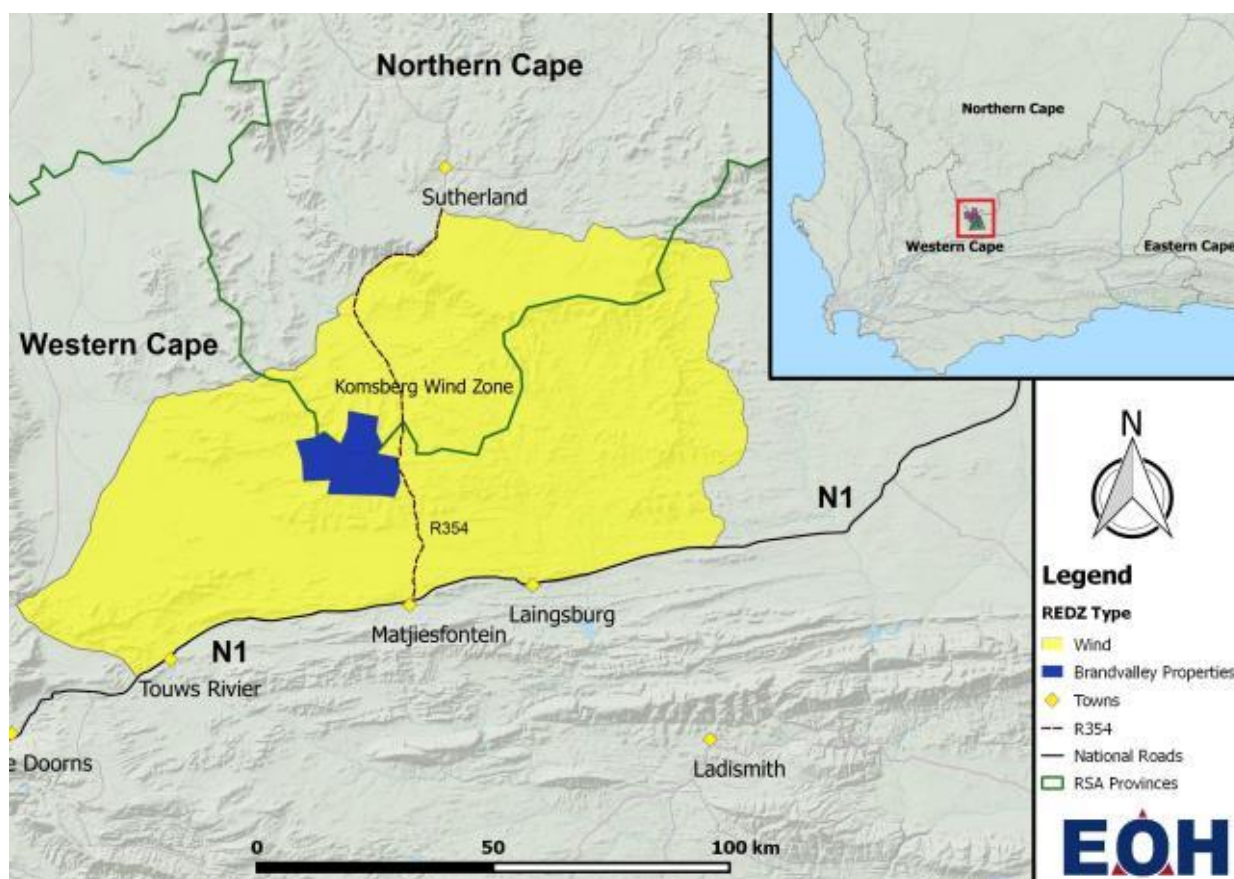


Figure 4-2: The proposed Brandvalley WEF project site in relation to the REDZs (zoomed in).

4.3.4 Proximity to other wind energy projects and electrical infrastructure

There are other wind energy developments and electrical infrastructure proposed and existing in close proximity to the Brandvalley WEF. These facilities are in various stages of development ranging from application phase to authorisation (environmental authorisation and preferred bidder). Although each location has its own wind patterns, the close proximity of wind farms in an area does have environmentally preferred advantages such as limiting certain impacts to that location as opposed to impacting a number of areas. It also confirms the region/locality as a high wind resource and a suitable area for renewable energy development.

The following projects are located within a 30km buffer around Brandvalley WEF:

- Konstabel Solar Project;
- Roggeveld Wind Project;
- Perdekraal Wind Project;
- Witberg Wind Project;
- Sutherland Wind and Solar Project;
- Hidden Valley Wind Project;
- PV Solar Project, south of Sutherland;
- Suurplaat Wind Project;
- Gunstfontein Wind Project;
- Komsberg Substation; and
- Rietkloof Wind Project.

Furthermore, there are high voltage transmission lines (one 786kV and two 400kV power lines) running immediate south of the project area, running between the Komsberg station and the Kappa substation.

The recently built 765kV line runs from the Gamma substation near Victoria West past the Kappa substation near Touwsriver (southwest of the project site) to connect to the Omega substation near Koeberg. This is part of Eskom’s grid strengthening project for power transmission and distribution in South Africa.

The Komsberg capacitor station located southeast of the project site has two 400 kV lines running through its capacitor banks from the Droerivier substation to the Bacchus and Muldersvlei substations, respectively, via the Kappa substation.

The approved renewable energy projects located in the vicinity are intended to be connected to the Komsberg station where new substation infrastructure will be built.

Projects located within the 30km buffer radius will be considered in the cumulative impact assessment. Please refer to Chapter 9, section 9.6 for more information regarding the assessment of cumulative impacts.

4.3.5 Wind resource

The Karoo, and more specifically the proposed location, is identified as a feasible area for wind energy in terms of the Wind Atlas for South Africa (WASA) for the Western Cape and parts of the Northern, Western and Eastern Cape Provinces. WASA is a tool for identifying areas suitable for large-scale wind power generation and to provide more accurate wind resource data to identify potential off-grid wind generation location opportunities, using high climatological (30-year) annual mean wind speed (m/s) 100m above ground level. Figure 4.3 below indicates the proposed location in relation to the WASA.



Figure 4-3: The Proposed Brandvalley WEF located within an area of high wind energy resources as identified by WASA.

Brandvalley WEF is located in an area where three wind projects were selected as preferred bidders under the REIPPPP. This is a good indication that the area has high wind resources and the projects are competitive for succeeding in the REIPPPP.

Brandvalley Wind Farm, the applicant, has monitored the wind resource in the greater area for the past five years and has confirmed the high wind resources with certainty. The direct project area is currently being monitored by six wind monitoring masts to confirm the onsite wind resource which has informed the preliminary layout of the facility.

4.3.6 Grid capacity and access

Grid access is deemed favourable for this site due to the close proximity of the existing Eskom Capacitor station, which is planned to accommodate a 400kV Substation. The current Komsberg substation area is currently proposed to be expanded as hub for connecting preferred bidder and future developments in the area. The distance from a substation directly affects construction costs and losses associated with power transmission over a distance. The existing Eskom 400kV Komsberg Substation has sufficient grid capacity for the proposed project to connect.

Similar to the Renewable Energy SEA, Eskom's Electricity Grid Infrastructure Strategic Environmental Assessment (Grid SEA) is also underway. The SEA is in accordance with the government's commitment to implement the NDP and improve on infrastructure. More specifically, the Grid SEA is in support of SIP 10, which aims to achieve "Electricity and distribution for all" and t. The area in which the Brandvalley Wind Farm is proposed is currently within the corridor planned to be strengthened by Eskom as part of the Grid SEA. The Grid SEA aims to provide widespread distribution of electricity throughout South Africa and to initialise economic development within areas limited to electricity access to meet the country's economic and social development needs.

4.3.7 Land suitability

The current land use is Agricultural which is desirable as the majority of farming practices can continue simultaneously to construction and operation of the wind farm. The landowners are supportive of the development and do not view the development as conflicting with their current land use practices.

4.3.8 Turbine import and transportation

The project area is in close proximity to the N1 national road. The R354 is the main arterial road providing access to the project area, where there are a number of existing local, untarred roads providing access within the project area. The use of existing roads is desirable as this will facilitate transport of construction materials and turbines. Existing roads will be upgraded and used as far as possible in order to develop fewer new roads, which will result in minimal environmental damage.

4.3.9 Social

As described in Section 6.3, the area is characterised by high unemployment rates and low levels of education. The proposed WEF has a potential to create much needed employment opportunities for unskilled locals during the construction phase. Training opportunities will also be afforded to qualified local people who can be up-skilled to undertake certain roles during the construction and operational phases.

In terms of the needs on the local community, the IDPs identify the need for development, social services, education and employment opportunities in this area. The Brandvalley WEF has a potential to make a positive contribution towards the identified community needs. In terms of the economic development requirements of the REIPPPP, the project will commit to benefits for the local community, including job creation, localisation and community ownership.

A percentage of the revenue per annum from the operational wind energy facility will be made available to the community through a social beneficiation scheme, in accordance with the DoE bidding requirements of the REIPPPP. Therefore, the potential for creation of employment and business opportunities, and the opportunity for skills development for the local community is significant.

Secondary social benefits can be expected in terms of additional spend in the nearby towns due to the increased demand for goods and services.

4.4 Summary on need and desirability

The need and desirability of the Brandvalley WEF can be summarised as follows:

- The project site has high wind resources as confirmed by onsite wind monitoring campaigns. The economic viability of a WEF and success in the REIPPPP directly depend on the strength of the wind resource.
- Proximity to grid connectivity via the Komsberg Substation currently proposed for expansion to cater for the proposed projects in the area.
- The national need for establishment of additional generation capacity through renewable energy resources.
- The local need for community upliftment through additional employment opportunities within the project area and economic development contributions in terms of the REIPPPP.
- Site extent and the option for the current land use namely agriculture to be retained.
- Landowner support for wind farm development.
- Being located within the Renewable Energy and Electricity Grid Infrastructure SEAs.
- The proximity to the N1 and secondary roads for use during the construction and operation phases for the transportation of material and components.

5. RELEVANT LEGISLATION

According to Appendix 2(2) of the EIA Regulations (GNR. 982 of 2014), a *Scoping Report must contain all the information necessary for a proper understanding of the process, informing all preferred alternatives, including location alternatives, the scope of the assessment, and the consultation process to be undertaken through the environmental impact assessment process, and must include –*

- (e) *A description of the policy and legislative context within which the development is proposed including identification of all legislation, policies, plans, guidelines, spatial tools, municipal development planning frameworks and instruments that are applicable to this activity and are to be considered in the assessment process;*

The development of the proposed Brandvalley WEF will be subject to various South African legislative requirements. In addition to the environmental authorisation, there are other permits, contracts and licenses that will need to be obtained by the project proponent for the proposed project, some of which fall outside the scope of the EIA. The relevant national legislation, policies and conventions to which South Africa is a signatory to are described in Table 5-1 below.

Table 5-1: Relevant Legislation.

LEGISLATION	RELEVANCE TO THE PROPOSED PROJECT	PERMIT / LICENCE REQUIRED	COMMENT
ENVIRONMENTAL			
The Constitution of South Africa (Act 108 of 1996)	The WEF developer has an obligation to ensure that the proposed activity is ecologically sustainable, will not result in pollution and ecological degradation while demonstrating economic and social development and upholding environmental rights.	N/A	-
National Environmental Management Act (107 of 1998) (NEMA)	This EIA will be undertaken in terms of NEMA requirements. The WEF developer must be mindful of the principles, broad liability and implications associated with NEMA and must eliminate or mitigate any potential impacts.	X	-
Environmental Impact Assessment (EIA) Regulations, 2014	The proposed development triggers the three lists of activities, published on 4 December 2014, as Listing Notices GN R.983, R.984, and R.985. These Listing Notices define the activities that require, respectively, a Basic Assessment (applies to activities with limited environmental impacts listed in GN R. 983 and R.985), or a Scoping and EIA (applies to activities which are significant in extent and duration listed in GN R. 984) process. Based on the NEMA EIA listed activities identified by the EAP, namely the Listing Notice 2 (GN R.984), the proposed project's EIA application will be subject to the Scoping and EIA reporting process as stipulated in the Regulations. The relevant competent authority is the National DEA. This Assessment will be submitted to the DEA to ensure that the national environmental principles, fair decision making and integrated environmental management approach is applied through the process. The assessment and associated environmental management plan aim to prevent pollution and ecological degradation, promote conservation and secure ecological sustainable development and use of natural resources while promoting justifiable economic and social development, as outlined in the Act.	X	-
The National Environment Management: Biodiversity Act (10 of 2004)	The project development area located within the Western Cape and certain sections of the Northern Cape are considered to be a Critical Biodiversity Area which means there are potentially sensitive and potentially irreplaceable vegetation. To avoid and or mitigate threats to any endangered ecosystems all impacts on sensitive ecosystems will be assessed in detail during the EIA process to ensure the impacts of the proposed development are understood and can be mitigated; If the specialist ecology assessment identifies protected species on site that will be at risk due to project related activities the WEF developer will require the necessary permit(s) in terms of this act; and construction and operational activities could leave the development area susceptible to alien vegetation. To	X	A permit may be required depending on the outcome of the detailed Ecological Specialist Assessment.

LEGISLATION	RELEVANCE TO THE PROPOSED PROJECT	PERMIT / LICENCE REQUIRED	COMMENT
	avoid alien vegetation from establishing on disturbed areas, appropriate measures will be implemented.		
National Water Act (36 of 1998)	The WEF and its associated infrastructures could potentially alter the bed, banks, course or characteristics of a watercourse. For instance, road crossings. Once the layout is finalised and exact locations of the watercourse crossing confirmed, the WEF developer will apply for the relevant water authorisations from the DWS.	X	-
National Environmental Management: Waste Act (No. 59 of 2008)	Construction activities will generate construction related waste that will need to be disposed of at a registered landfill site if the waste cannot be recycled or reused. Waste generated will be dealt with in a manner compliant with the requirements of the Act.	N/A	-
National Environmental Management: Air Quality Act (39 of 2004)	The clearing of vegetation, turbines foundation excavations, stockpiles and transportation of materials might result in dust fall out. It is expected to be below the dust control regulations of 2013 since mitigation measures will be implemented to reduce dust fall out. Dust control regulations were published under Government Notice R827 in Government Gazette 36974 of 1 November 2013.	N/A	-
National Veld and Forest Fire Act (No. 101 of 1998)	The proposed project must register as a member of the fire protection association in the area as required in Section 3 of the Act. The developer will be required to take all practical measures to ensure that fire breaks are prepared and maintained according to the specifications contained in Section 12 - 14 of Chapter 4.	N/A	-
National Forests Act (84 of 1998)	If any protected trees in terms of this Act occur on site and would need to be removed, the developer will require a licence from the Department of Agriculture, Forestry and Fisheries to perform any of the above-listed activities	X	A licence may be required depending on the outcome of the detailed Ecological Specialist Assessment.
Conservation of Agricultural Resources Act (43 of 1983)	Approval will be required from the Department of Agriculture, Forestry and Fisheries (DAFF) for any activities on the land zoned for agriculture and any proposed rezoning or sub-divisions of agricultural land. An agricultural potential assessment will be conducted to determine how the proposed development may impact on the agricultural production potential of the WEF site. Comment from DAFF will be obtained. The area is currently used for grazing and will continue to be used for grazing after construction. The majority of infrastructure will be placed on ridgelines and are unlikely to be of high agricultural potential.	X	-
Subdivision of Agricultural Land Act (No. 70 of 1970)	Long-term lease agreements (over 10 years) on portion/s of agricultural land require the consent from the Minister of t Agriculture, Forestry and Fisheries before they can be registered. Some of the leases for the project may be on portions of the properties and will require a consent from DAFF.	X	Separate applications will be submitted to DAFF in respect of lease agreements that trigger SALA (Act 70 of 1970)
Mineral and Petroleum Resources Development Act (107 of 2002) (MPRDA)	Borrow pits and or quarries will potentially be required to source material for road and turbine construction.	X	The borrow pits and/or quarries will permit/ licence requirements will be assessed in a separate Basic Assessment

LEGISLATION	RELEVANCE TO THE PROPOSED PROJECT	PERMIT / LICENCE REQUIRED	COMMENT
			process.
SOCIAL			
Occupational Health and Safety Act (85 of 1993)	The developer must be mindful of the principles and broad liability and implications contained in the Operational Health and Safety Act and mitigate any potential impacts.	N/A	Applicable at all stages of development. All contractors need to adhere to Act.
National Heritage Resources Act (25 of 1999)	The project will be registered with South African Heritage Resource Agency (SAHRA). A desktop heritage assessment has been undertaken to determine if heritage features occur on site and what level impact assessment (if any) maybe required. In the event that archaeological or historically significant sites would be destroyed, damaged, excavated, altered or defaced by the proposed project activity the relevant permit will be granted before the project can continue. <u>A Notice of Intent to Develop (NID) will were submitted to Heritage Western Cape (HWC) and Ngwao-Boswa Ya Kapa Bokone (Northern Cape heritage authority)SAHRA on 19 February 2016.</u>	X	Pending the outcome of the heritage impact assessment.
PLANNING			
National Road Traffic Act (No. 93 of 1996)	All the requirements stipulated in the NRTA will need to be complied with during the construction and operational phases of the proposed WEF.	X	N/A for the EIA process.
Civil Aviation Act (Act No. 13 of 2009): 13th Amendment of the Civil Aviation Regulations (2011)	Due to requirements of the Act to ensure the safety of aircrafts, the WEF developer must engage directly with the Civil Aviation Authority (CAA) regarding the structural details of the facility.	X	Comment will be requested from the CAA.

5.1 Other Relevant Legislation

At this stage in the EIA process the above list of applicable legislation should not be regarded as definitive or exhaustive, and it is probable that additional legislative requirements will be identified as the process progresses. This is particularly applicable to any relevant municipal by laws that will have to be adhered to.

The Terms of Reference (ToR) for most of the respective specialist studies will include the need for a review of all relevant legislation and guidelines pertaining to the proposed development and to their given fields of expertise.

Other legislation that may be relevant to the proposed wind energy project are listed in the sections below.

5.1.1 International

- The 1992 United Nations Framework Convention on Climate Change (UNFCCC).
- The Kyoto Protocol (2002).

5.1.2 National

- Basic Conditions of Employment Act (Act no 75 of 1997).
- Electricity Regulation on New Generation Capacity (Government Gazette No 32378 of 5 August 2009).
- Electricity Regulation Act (Act No. 4 of 2006).

- Employment Equity Act (Act no 55 of 1998).
- Industrial Policy Action Plan 2011/12 – 2013/14.
- Integrated Energy Plan for the Republic of South Africa, March 2003.
- Integrated Resource Plan for Electricity 2010-2030.
- Long Term Mitigation Scenarios (2007).
- Municipal Systems Act (Act 32 of 2000).
- National Development Plan (2011).
- National Climate Change Response White Paper (2012).
- National Energy Bill (2008).
- Spatial Planning and Land Use Management Act (Act No. 16 of 2013).
- Strategic Infrastructure Projects (SIP) (2012).
- SIP 8: Green energy in support of the South African economy.
- SIP 9: Electricity generation to support socio-economic development.
- The Environment Conservation Act No. 73 of 1989 (ECA) Noise Control Regulations, which specifically provide for regulations to be made with regard to the control of noise, vibration and shock, including prevention, acceptable levels, powers of local authorities and related matters.
- The Mountain Catchment Areas Act No. 63 of 1970 provides for catchment conservation.
- The Skills Development Act No. 97 of 1998 promotes the development of skills.
- The Telecommunication Act of 1966 which has certain requirements with regard to potential impacts on signal reception.
- The Tourism Act No. 3 of 2014 provides for the promotion of tourism and regulates the tourism industry.
- The Development Facilitation Act No. 67 OF 1995 Provides for development and planning.
- White Paper on Energy Policy for South Africa (Energy White Paper).
- White Paper on Renewable Energy Policy (2003) (Renewable Energy White Paper).
- Astronomy Geographic Advantage Act, 2007 (No. 21 of 2007).

5.1.3 Provincial

Northern Cape

- Northern Cape Planning and Development Act No 7 of 1998 regulates planning and development within the province (superseded by the Spatial Planning and Land Use Management Act 16 of 2013 (SPLUMA)).
- Northern Cape Environmental Implementation Plan (EIP) is a key framework promoting environmental management and co-operative governance.

Western Cape

- Western Cape Land Administration Act 6 of 1998 regulates land and land usage (superseded by the Spatial Planning and Land Use Management Act 16 of 2013 (SPLUMA)).
- Western Cape Planning and Development Act 7 of 1999 regulates planning and development within the Province.
- Western Cape Nature Conservation Laws Amendment Act (No. 3 of 2000).
- Cape Nature and Environmental Conservation Ordinance (No. 19 of 1974).
- Western Cape Noise Control Regulations 2013.

The DEA&DP 2010 and 2014 EIA Guideline and Information Document Series will be considered throughout the EIA phase, informing the EIA process.

The following plans and frameworks are relevant to the project area and are discussed in detail in Chapter 4 of this report.

5.1.4 District Municipality Planning Documents

Relevant district planning documentation includes:

- The Cape Winelands District Municipality IDP (2012/13 – 2016/17), EMF (May 2011) and SDF (2007).
- The Central Karoo District Municipality IDP (2012-2017).
- The Namakwa District Municipality IDP (2012-2016) and SDF (Online interactive page).

5.1.5 Local Municipality Planning Documents

The relevant local planning documentation includes:

- The Karoo Hoogland Local Municipality IDP (2015/2016) and SDF (2010).
- The Witzenberg (Ceres) Local Municipality IDP (2012/2017) and SDF (2006)/SDF draft (2012).
- The Laingsburg Local Municipality IDP (2012/2017).

6. DESCRIPTION OF THE AFFECTED ENVIRONMENT

In terms Appendix 2(2) of the EIA Regulations (GN R. 982 of 2014), a Scoping Report must contain all the information necessary for a proper understanding of the process, informing all preferred alternatives, including location alternatives, the scope of the assessment, and the consultation process to be undertaken through the environmental impact assessment process, and must include–

(h) A full description of the process followed to reach the proposed preferred activity, site and location within the site, including –

(iv) The environmental attributes associated with the alternatives focusing on the geographical, physical, biological, social, economic, heritage and cultural aspects;

(ix) The outcome of the site selection matrix;

This section of the report provides a description of the ecological, social and economic description of the environment that may be directly or indirectly affected by the proposed project.

6.1 The Bio-Physical Environment

The proposed WEF falls within both the Western Cape and the Northern Cape Provinces. In the Northern Cape Province, it falls within the Karoo Hoogland Local Municipality in the Namakwa District Municipality. In the Western Cape, it falls within the Laingsburg and Witzenburg Local Municipalities in the Central Karoo and Cape Winelands District Municipalities, respectively. A biodiversity summary of each municipality is provided in Table 6-1 below.

Table 6-1: Biodiversity summary for the municipalities in which the proposed project area falls (BGIS, 2015).

	Karoo Hoogland Municipality	Laingsburg Municipality	Cape Winelands Municipality
Size (ha)	2939678.2ha	878448ha	1076276.2ha
Area remaining natural (%)	99%	96.6%	91.6%
Reserves (distance from the project site)	- Tankwa Karoo National Park (~75km)	- Anysberg Nature Reserve (~30km) - Gamkapoort Nature Reserve (~100km) - Gamkaskloof (Die Hel) Nature Reserve (~100km) - Groot Swartberg Nature Reserve (~100km) - Klein Swartberg Mountain Catchment Area (~70km) - Towerkop Nature Reserve (~80km)	- Anysberg Nature Reserve (~30km) - Ben-Etive Nature Reserve (~90km) - Bokkeriviere Nature Reserve (~60km) - Boosmansbos Wilderness Area (~100km) - Cederberg Mountain Catchment Area (~100km) - Koue Bokkeveld Mountain Catchment Area (~100km) - Langeberg -Oos/East Mountain Catchment Area (~100km) - Langeberg -Wes Mountain Catchment Area (~60km) - Matroosberg Mountain Catchment Area (~90km) - Tankwa Karoo National Touw Local Authority Nature Reserve Park (~50km) - Warmwaterberg Nature Reserve (~80km)
Biomes	- Fynbos - Nama-Karoo - Succulent Karoo	- Albany Thicket - Fynbos - Nama-Karoo - Succulent Karoo	- Fynbos - Succulent Karoo
No. of vegetation types	14	19	31
Threatened terrestrial ecosystems	None	None	- Kouebokkeveld Alluvium Fynbos (Endangered – EN) - Cederberg Sandstone Fynbos (Vulnerable – Vu) - Ceres Shale Renosterveld (Vulnerable – Vu) - Kouebokkeveld Shale Fynbos (Vulnerable – Vu) - Montagu Shale Renosterveld (Vulnerable – Vu)
Water Management Areas	- Gouritz - Lower Orange - Olifants/Doom	- Gouritz - Lower Orange - Olifants/Doom	- Gouritz - Lower Orange - Olifants/Doom
No. of rivers	28	8	23
No. of wetlands	3099	420	1641

6.1.1 Climate

The project area has an arid to semi-arid climate. The project area experiences rainfall throughout the year with peak rainfall occurring during the winter season (from May to August). The mean annual precipitation (MAP) is 150mm, with the project area receiving the lowest rainfall (4mm) in January and the highest (28mm) in June (Figure 6-1).

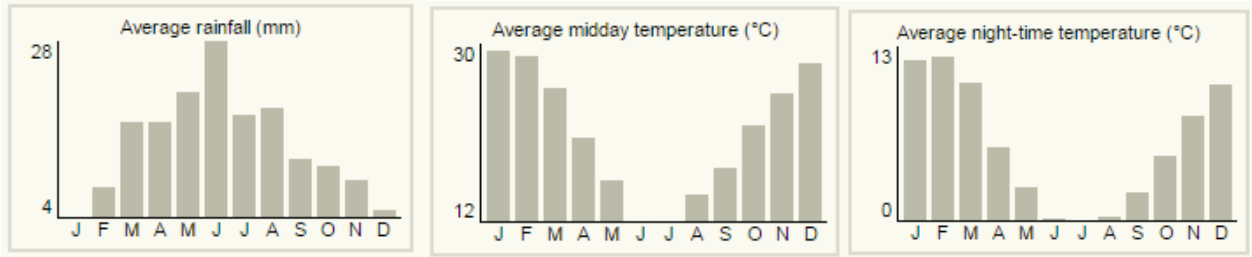


Figure 6-1. The average annual rainfall, midday and night-time temperature.⁴

The average midday temperatures range from 12.4°C in June to 29.3°C in January. The lowest temperatures are experienced in July with average temperatures of 0°C at night. The mean annual temperature (MAT) is approximately 16°C and the incidence of frost is relatively high (approximately 30 days). The wind direction is predominately north-west with average high wind speeds of up to 7 meters per second (m/s).

The project area is located approximately 60km south of the town of Sutherland, in the Northern Cape Province and approximately 30km north from Matjiesfontein, in the Western Cape Province. The town of Laingsburg is a further 30km east of Matjiesfontein, along the N1 national road in the Western Cape Province. Sutherland has cold temperatures and commonly experiences snow in the winter season. The average annual temperature for Sutherland is 11.3°C and the average annual minimum temperature is a low of 2.8°C. The town of Laingsburg is located in a semi-desert region with hot and dry summers of temperatures, commonly reaching temperatures higher than 30°C. The winter season experience much lower temperatures with occasional snow occurring in the surrounding area.

6.1.2 Geology and Topography

The surrounding area consists of a slightly undulating to hilly landscape, while the majority of the project area comprises slopes and broad ridges of low mountains and escarpments as shown in Plate 6-1, Plate 6-2 and Figure 6-2.



Plate 6-1: Photograph illustrating the topography of the outer southern regions and surrounding area of the project area.

⁴ Source: (SA Explorer, 2015)



Plate 6-2: Photograph illustrating the general topography of the project area.

The underlying geology of most of the project area comprises of clayey soils of Fc and Ib land types located on the mudstones and sandstones of the Adelaide Subgroup of the Beaufort Group, with smaller areas of arenite shale (Figure 6-3). The properties located on the northern and western sections of the project area additionally comprise sandstone, shale and mudstone of the Permian Waterford Formation of the Eccca Group and lithified sedimentary rock of the Dwyka Group of Fc and Ib land types. The Beaufort, Eccca Group and Dwyka Groups are all of the Karoo Supergroup.

The majority of the project area comprises Lithosols, shallow soils with minimal development on hard or weathering rock, with or without intermittent diverse soils. Lime is generally present in parts or most of the landscape. The central portion of the project area comprises rock with limited soils.

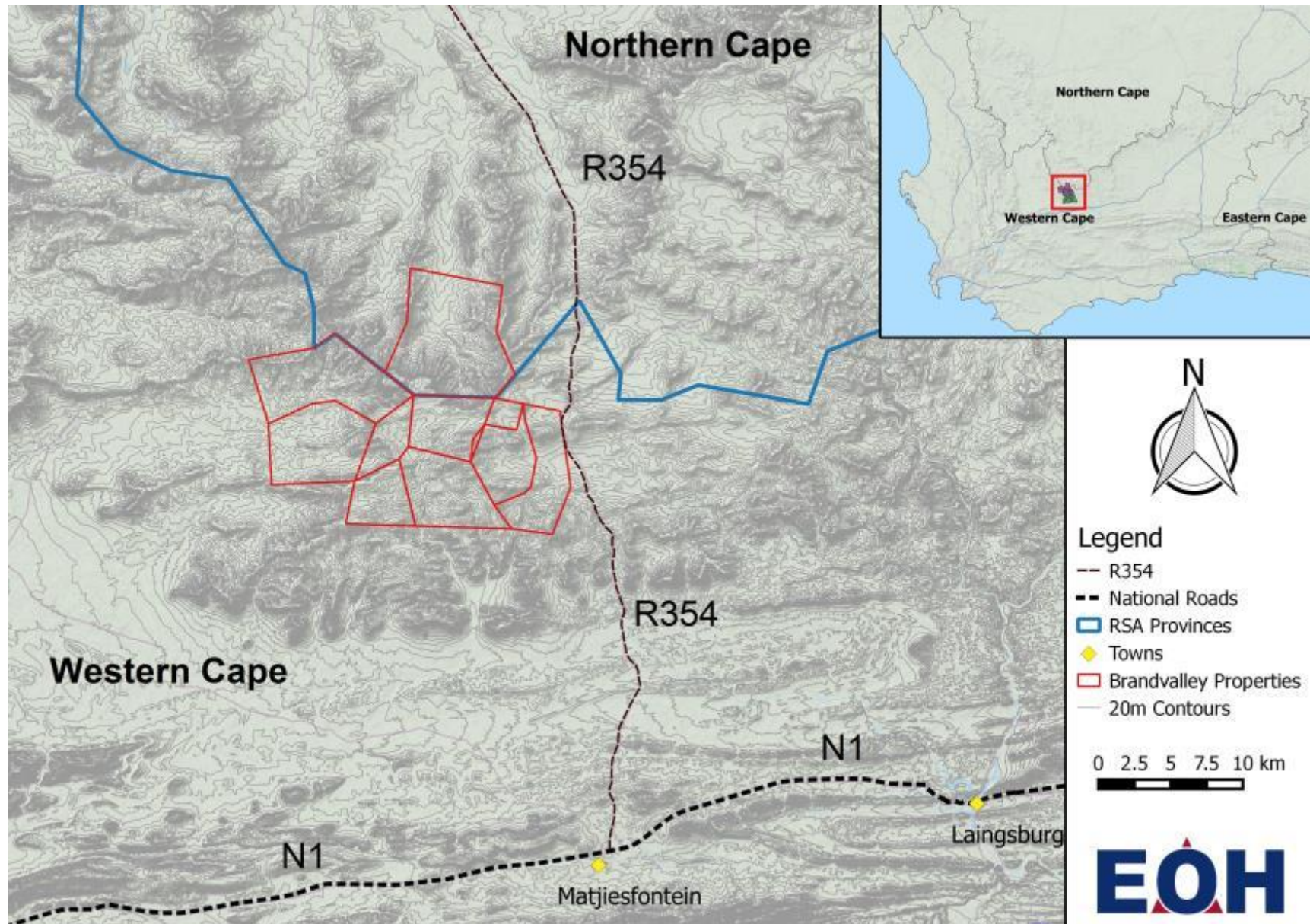


Figure 6-2: The topography of the proposed Brandvalley WEF project area.

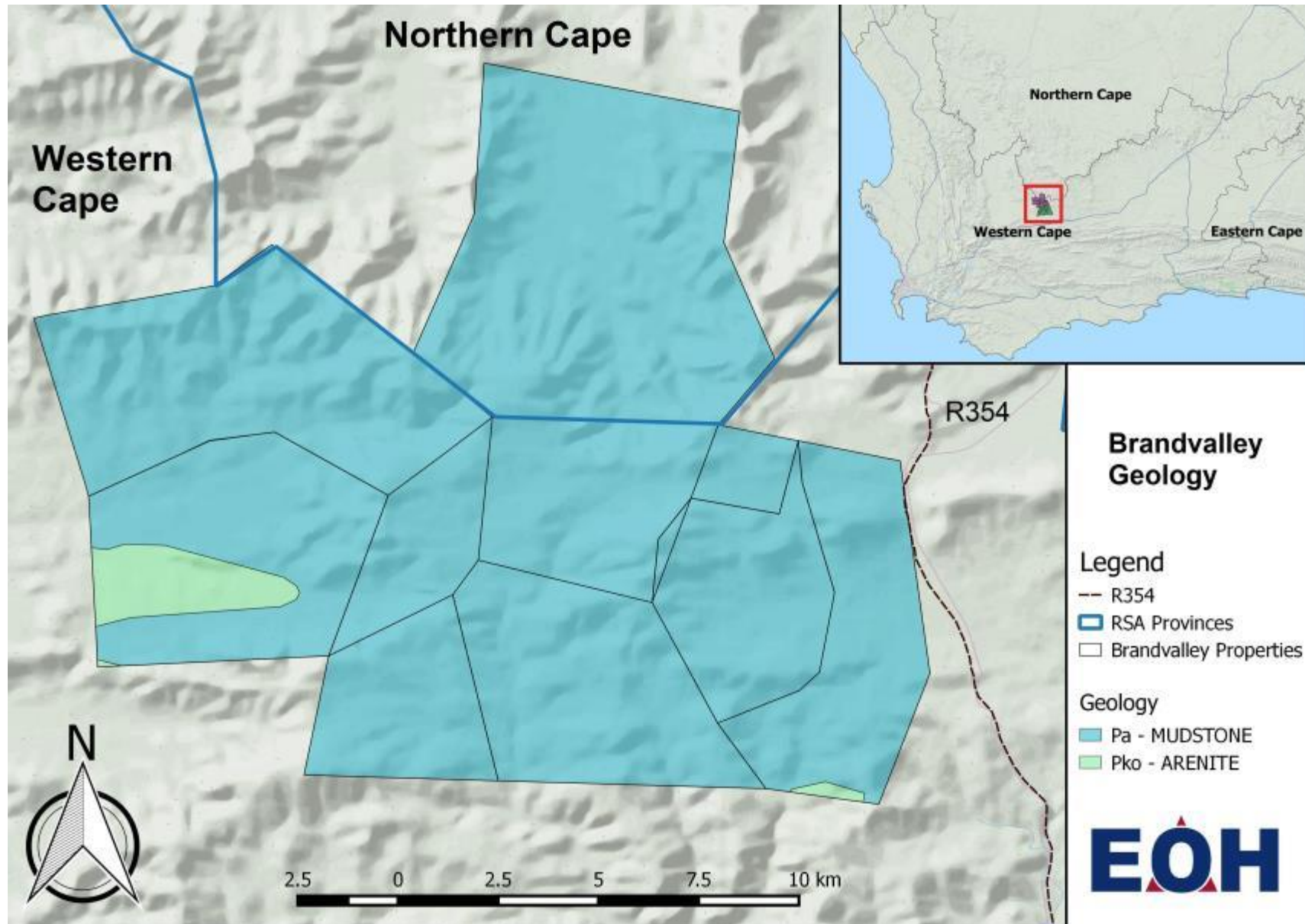


Figure 6-3. The geology of the proposed Brandvalley WEF.

6.1.3 Agricultural Potential

Any land is considered to have potential for agricultural practices if it meets all requirements for cultivation purposes, as stipulated in the Conservation of Agricultural Resources Act (No. 43 of 1983), and is:

- a) under permanent irrigation, or
- b) can be classified into one of the soil forms and families as listed by the Soil Classification System of South Africa, and
- c) the effective soil depth is equal to or greater than the minimum as listed by the Department of Agriculture guidelines, and
- d) the average topsoil clay content falls within the limits as listed by the Department of Agriculture guidelines.

All the properties impacted by the WEF have been classified by the Department of Agriculture (reference: AGIS) as agricultural land and has the potential for either crop or livestock farming.

Land Capability

Land capability is defined as the inherent capacity of land to be productive under sustained use and specific management methods. Land capabilities are derived by combining the land systems information with climatic, agronomic and forestry data.

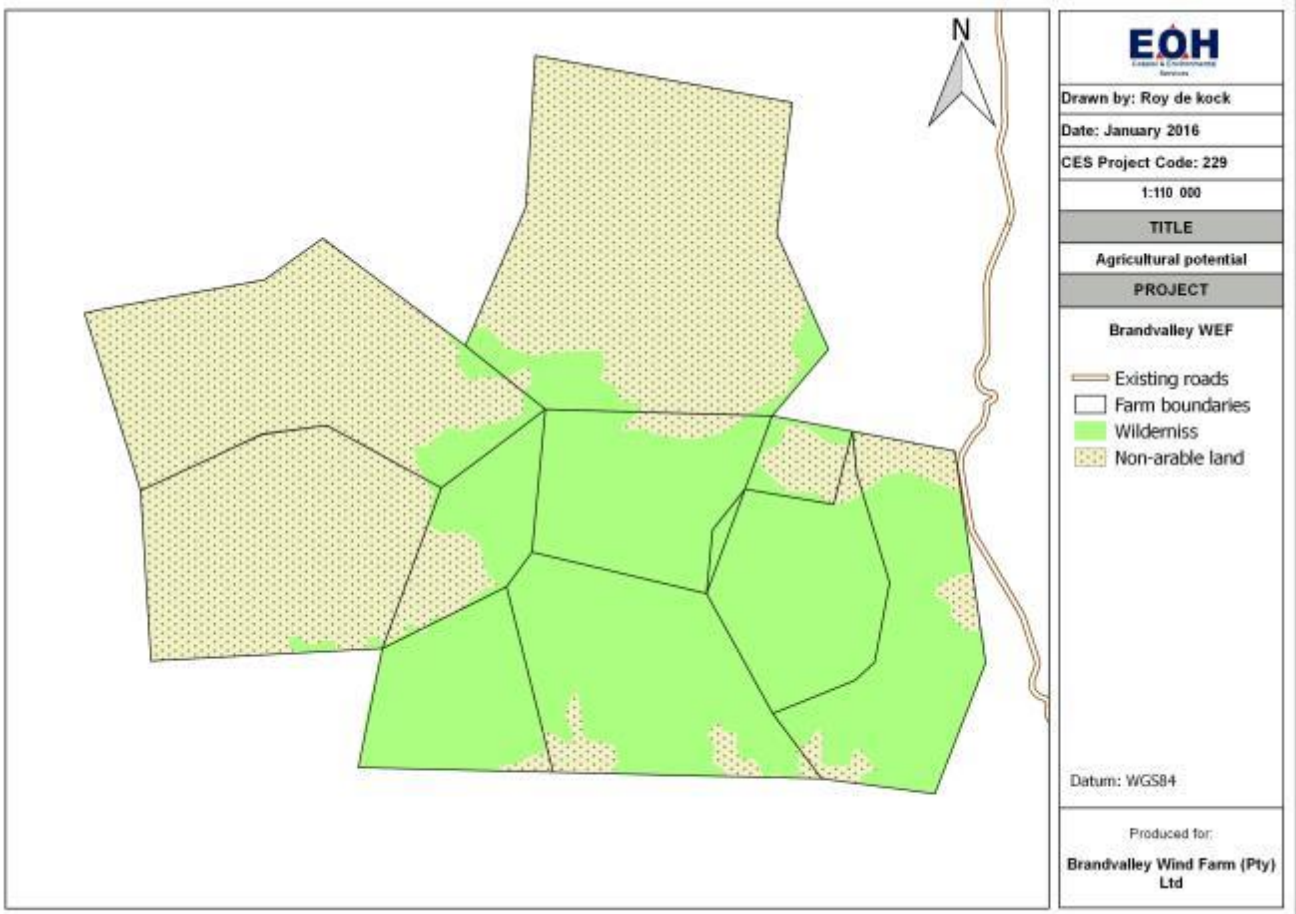


Figure 6-4: Agricultural potential of project site.

The Brandvalley WEF has been classified as non-arable agricultural land with a low potential for grazing livestock and, unless under irrigation, no potential for field crops or horticulture (Figure 6-4). Generally, agricultural activities are compatible with a wind farms and can continue in tandem.

A large portion of land in are classified as wilderness where dense vegetation and undulating topography renders the land unsuitable for commercial agriculture. An agricultural impact assessment that will be undertaken by a specialists during the EIA phase will further inform the

determined classifications.

This will be groundtruthed to inform the EIA phase.

Grazing Capacity

The grazing capacity of a grazeable portion of a homogeneous unit of vegetation can be defined as the area of land required to maintain a single animal unit (AU) over an extended number of years without deterioration of the vegetation or soil (ha/AU).

An AU, also commonly referred to as a large stock unit (LSU), is defined as an animal with a mass of 450 kg, which gains 0.5 kg/day on forage with a digestible energy percentage of 55 %.

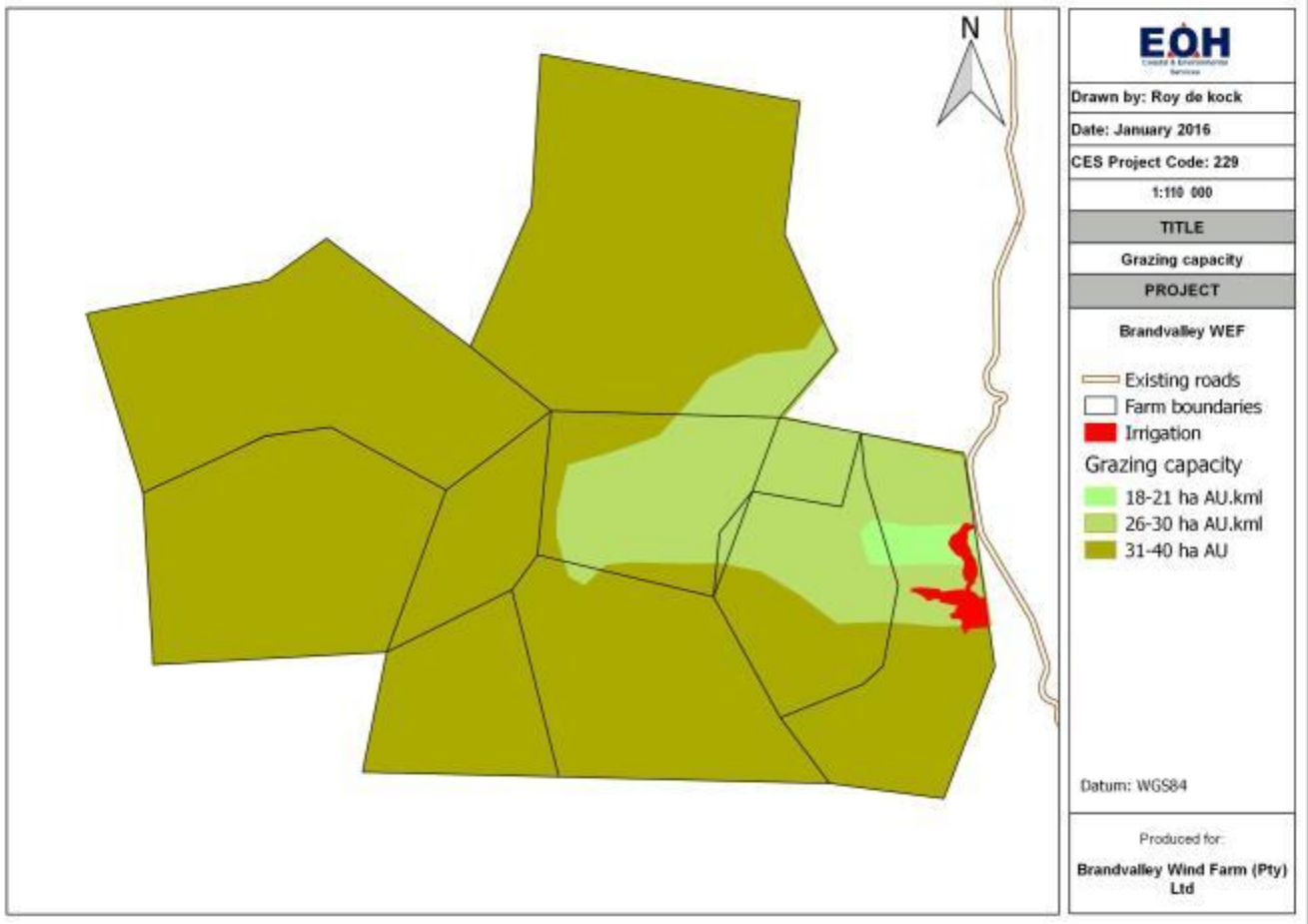


Figure 6-5: Grazing capacity of proposed project site.

The grazing capacity on the Brandvalley WEF site is considered as low, increasing from extremely low values (41-60 ha/AU) in the south, north and west to average values of 18-21 ha/AU in a small area in the eastern section of the WEF site (Figure 6-5).

6.1.4 Vegetation

Regional Context of the Vegetation

The project area falls within the Fynbos Biome of the Shale Renosterveld Group of the Karoo Renosterveld Bioregion and the Succulent Karoo Biome, of the Rainshadow Valley Karoo Bioregion (Mucina and Rutherford, 2006). The Fynbos Biome, with a Mediterranean-climate, comprises three naturally fragmented vegetation types, namely Fynbos, Renosterveld and Strandveld, that are dominated by small-leaved, evergreen shrubs that regenerate when exposed to fire. The Fynbos Biome is one of two biomes that is endemic to South Africa.

The Succulent Karoo Biome covers approximately 111 000km and is therefore the fourth largest biome in southern Africa. The Succulent Karoo is one of only two semi-arid biodiversity hotspots in the world. The Succulent Karoo experiences winter rainfall in comparison with the Nama Karoo with summer rainfall. The combination of both summer and winter rainfall contributes to the high biodiversity occurring in the area. The vegetation of the area includes Central Mountain Shale Renosterveld, occurring in majority of the project area, and Koedoesberge-Moordenaars Karoo, found in the northern and western regions of the project area (Figure 6-6).

SANBI National Vegetation Map

Mucina and Rutherford (2006) developed the National Vegetation Map as part of a South African National Biodiversity Institute (SANBI) funded project: "It was compiled to provide floristically based vegetation units of South Africa, Lesotho and Swaziland at a greater level of detail than had been available before." The map was developed using a wealth of data from several contributors and has allowed for the best national vegetation map to date, the last being that of Acocks developed over 50 years ago. The National Vegetation map informs finer scale bioregional plans such as the Subtropical Thicket Ecosystem Project (STEP). This project had two main aims:

- to determine the variation in and units of southern African vegetation based on the analysis and synthesis of data from vegetation studies throughout the region, and
- to compile a vegetation map. The aim of the map was to accurately reflect the distribution and variation on the vegetation and indicate the relationship of the vegetation with the environment. For this reason, the collective expertise of vegetation scientists from universities and state departments were harnessed to make this project as comprehensive as possible.

The map and accompanying book describes each vegetation type in detail, along with the most important species including endemic species and those that are biogeographically important. This is the most comprehensive data for vegetation types in South Africa.

Succulent Karoo Ecosystem Programme (SKEP)

The Succulent Karoo biome extends from the south-west through to the north west of South Africa and up into Namibia (Driver *et al.*, 2003). It is classified as one of the 25 internationally recognised biodiversity hotspots and is the world's only arid hotspot. It is remarkably diverse with 6,356 plant species, 40% of which are endemic and 17% of which are listed on the Red Data list. Despite this rich diversity and high level of endemism, only 3.5% of the biome is formally conserved. As a result, the biome's diversity is under pressure from human impacts, especially mining, agriculture, overgrazing and climate change. The goal of the SKEP is therefore to provide a framework to guide conservation efforts of this unique biome (Driver *et al.*, 2003). SKEP is defined as a bi-regional development programme for Namibia and South Africa implemented for conservation of these ecosystems. Priority areas are identified to have conservation value and are most vulnerable. The three main aims of the project are to:

- "provide a hierarchy of priority actions to guide conservation efforts and donor investment in the biome (both on and off formal reserves);
- build human resource capacity to implement the plan by including training and mentorship activities as part of the planning process; and
- generate the institutional and government support required to ensure its effective implementation.

SKEP describes the vegetation types found in the project area as Mountain Succulent Karoo, Renosterveld and Upland Succulent Karoo (Figure 6-7).

Both Mucina and Rutherford (2006) and Succulent Karoo Ecosystem Plan (SKEP) have mapped the vegetation for the region. These vegetation maps and descriptions of the vegetation types are presented below.



Plate 6-4: Photographs illustrating the vegetation types found in the project area.

1. *Central Mountain Shale Renosterveld*

This vegetation type is found in the Northern and Western Cape Provinces on slopes and broad ridges of low mountains and escarpments, with tall shrubland dominated by renosterbos and large areas of succulent karoo shrubs, with rich geophytic flora in more open, wetter or rocky habitats. The conservation status of this vegetation type is listed as **Least Threatened**, with a conservation target of 27%. This vegetation type is not protected in statutory or private conservation area and only about 1% has been transformed.

2. *Koedoesberge-Moordenaars Karoo*

This vegetation type is found in both the Northern and Western Cape Provinces, in the broad area of Laingsburg and Merweville. It tends to occur on slightly undulating hills to hilly landscapes comprises low succulent scrubs, scattered tall shrubs and patches of “white” grass visible on plains. The dwarf shrubs include *Pteronia*, *Drosanthemum* and *Galenia*. This vegetation type is listed as **Least Threatened** with a conservation target of 19%. The vegetation type is classified as hardly protected, with only a very small portion statutorily protected in the Gamkapoort Nature Reserve. The vegetation is transformed only to a very small extent with no serious alien plant invasions recorded.

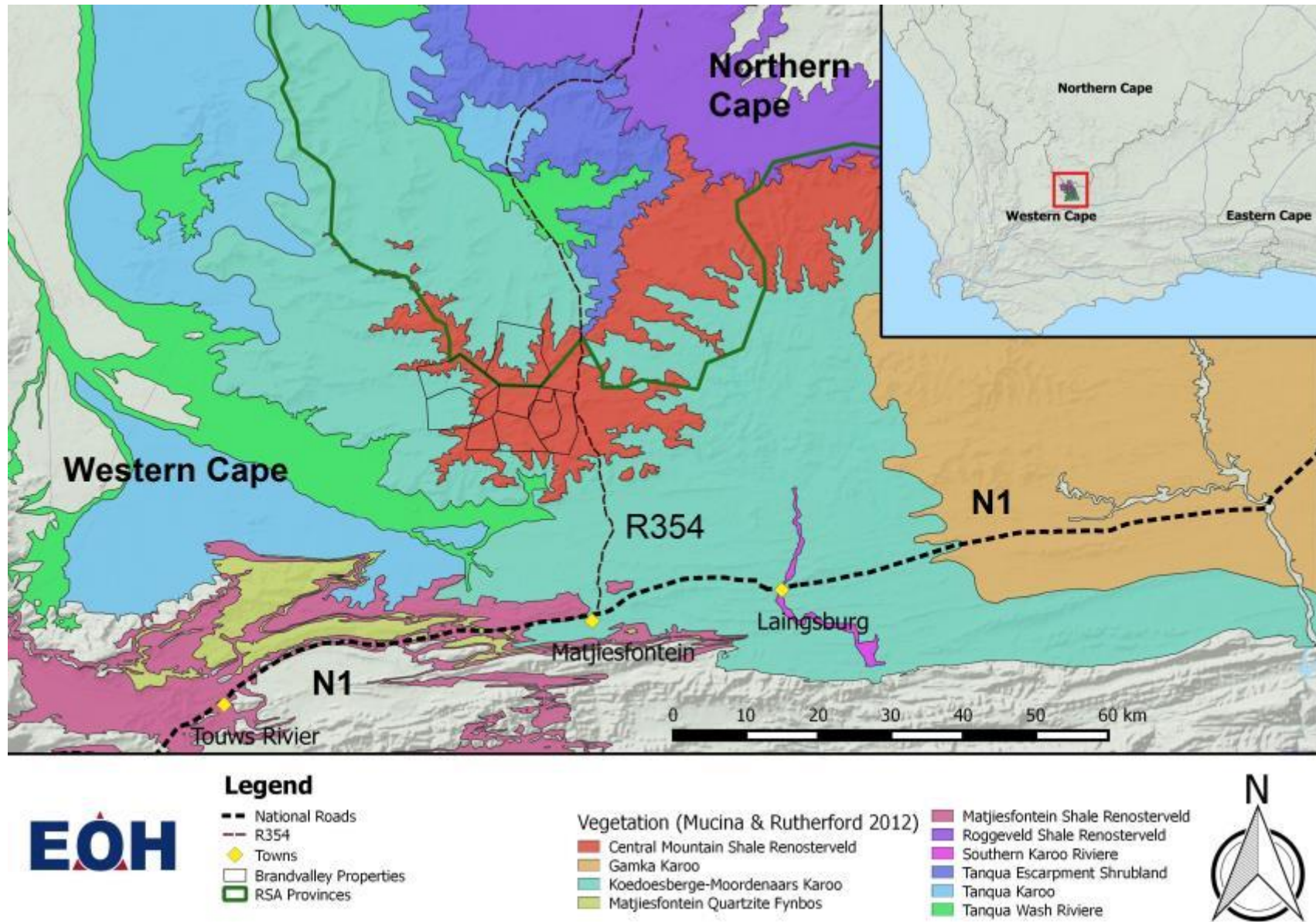


Figure 6-6: Vegetation map showing the vegetation classification of the proposed project area (Mucina and Rutherford, 2012).

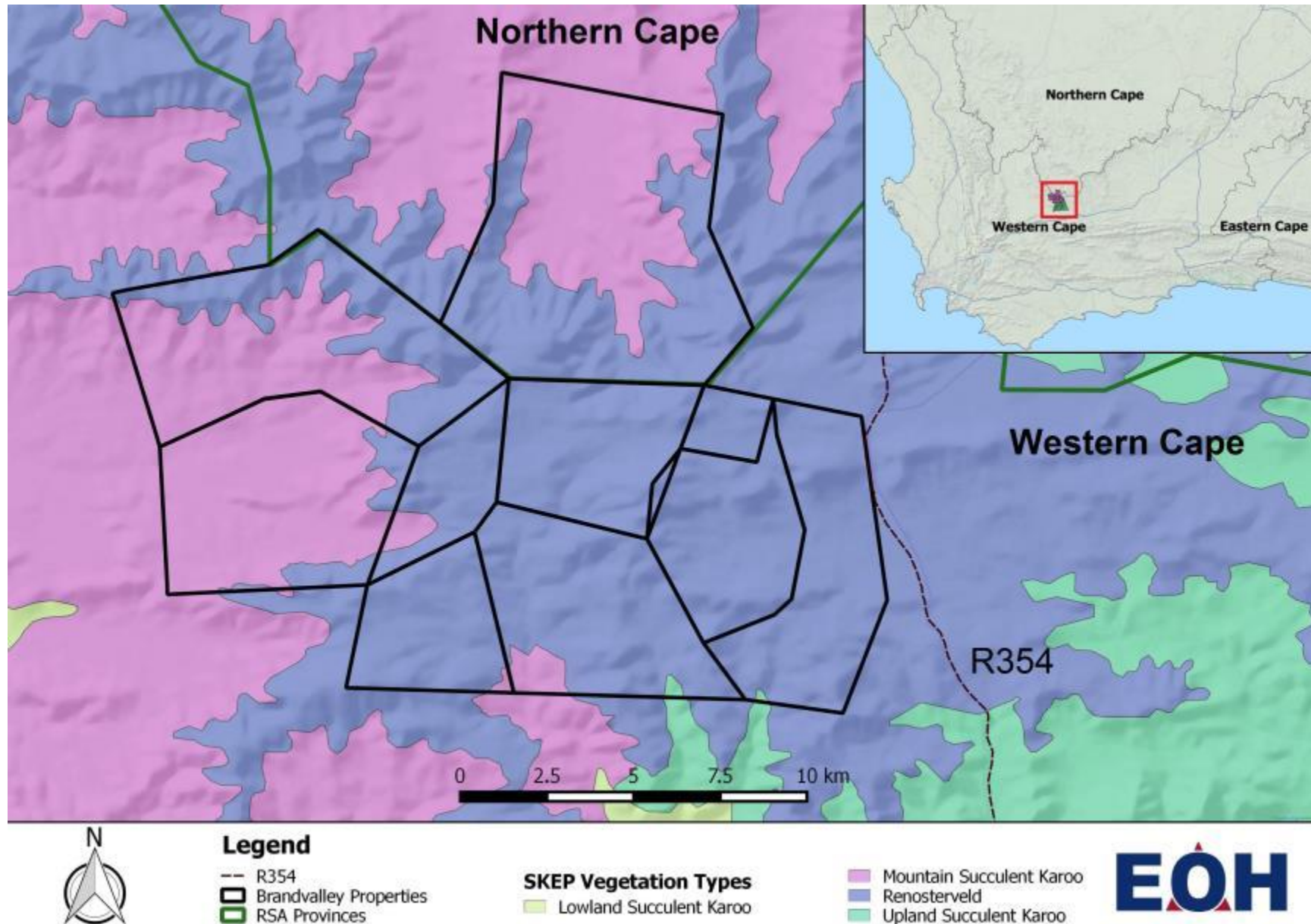


Figure 6-7: Vegetation map showing the SKEP vegetation groups of the proposed project area.

Consultation of historical records for the quarter degree square (QDS) (3220CD, 3220DC, 3320AB, 3320BA) within which the project area falls indicates that there are seventy-six species of conservation concern that may occur within the study area (Table 6-2) (SIBIS, 2016). Table 6-3 below provides a list of plant species of conservation concern status, as per the National Red List and IUCN.

Table 6-2: A summary of the number of plant species that occur on the SA Red Data list and IUCN.

Conservation Body	IUCN	Number of Species
IUCN	Vulnerable	1
	Near Threatened	1
SA Red Data List	Critically Endangered ⁵	4
	Endangered ⁶	6
	Vulnerable ⁷	22
	Near Threatened ⁸	12
	Rare ⁹	28
	Declining ¹⁰	2

Table 6-3: Species of Conservation Concern that are likely to occur within the study site (SIBIS, 2016).

Family	Scientific Name	SA Red List	IUCN Red List
RUTACEAE	<i>Acmadenia argillophila</i>	NT	-
CRASSULACEAE	<i>Adromischus humilis</i>	Rare	-
CRASSULACEAE	<i>Adromischus liebenbergii</i>	Rare	-
CRASSULACEAE	<i>Adromischus mammillaris</i>	EN	-
CRASSULACEAE	<i>Adromischus phillipsiae</i>	Rare	-
RUTACEAE	<i>Agathosma adenandriiflora</i>	NT	-
FABACEAE	<i>Amphithalea spinosa</i>	VU	-
FABACEAE	<i>Amphithalea tomentosa</i>	NT	-
FABACEAE	<i>Amphithalea villosa</i>	VU	NT
MESEMBRYANTHEMACEAE	<i>Antimima hamatilis</i>	VU	-
FABACEAE	<i>Aspalathus intricata subsp. anthospermoides</i>	Rare	-
ASPHODELACEAE	<i>Astroloba herrei</i>	VU	-
IRIDACEAE	<i>Babiana sambucina var. longibracteata</i>	EN	-
ORCHIDACEAE	<i>Bartholina etheliae</i>	LC	VU
AMARYLLIDACEAE	<i>Boophone disticha</i>	Declining	-
AMARYLLIDACEAE	<i>Brunsvigia josephinae</i>	VU	-
ASPHODELACEAE	<i>Bulbine torta</i>	Rare	-
ANTHERICACEAE	<i>Chlorophytum lewisiae</i>	Rare	-
ASTERACEAE	<i>Cineraria lobata subsp. lasiocaulis</i>	Rare	-
MESEMBRYANTHEMACEAE	<i>Cleretum lyratifolium</i>	Rare	-
CRASSULACEAE	<i>Crassula alpestris subsp. massonii</i>	Rare	-
CRASSULACEAE	<i>Crassula roggeveldii</i>	Rare	-
CRASSULACEAE	<i>Crassula rupestris subsp. commutata</i>	Rare	-

⁵ Critically Endangered (CR) – a CR taxon is considered to be facing an extremely high risk of extinction in the wild.

⁶ Endangered (EN) – an EN taxon is considered to be facing a very high risk of extinction in the wild.

⁷ Vulnerable (VU) – a VU taxon is considered to be facing a high risk of extinction in the wild

⁸ Near Threatened (NT) - A taxon is Near Threatened when it has been evaluated against the criteria but does not qualify for Critically Endangered, Endangered or Vulnerable now, but is close to qualifying for or is likely to qualify for a threatened category in the near future

⁹ Rare - A species is Rare when it meets at least one of four South African criteria for rarity, but is not exposed to any direct or plausible potential threat and does not qualify for a category of threat according to one of the five IUCN criteria.

¹⁰ Declining - A species is Declining when it does not meet or nearly meet any of the five IUCN criteria and does not qualify for Critically Endangered, Endangered, Vulnerable or Near Threatened, but there are threatening processes causing a continuing decline of the species.

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Family	Scientific Name	SA Red List	IUCN Red List
HYACINTHACEAE	<i>Drimia altissima</i>	Declining	-
APOCYNACEAE	<i>Duvalia parviflora</i>	VU	-
POACEAE	<i>Ehrharta eburnea</i>	NT	-
ASTERACEAE	<i>Eriocephalus grandiflorus</i>	Rare	-
EUPHORBIACEAE	<i>Euphorbia nesemannii</i>	NT	-
ASTERACEAE	<i>Euryops namaquensis</i>	VU	-
ASPHODELACEAE	<i>Gasteria disticha</i>	CR	-
ASPHODELACEAE	<i>Gasteria disticha var. disticha</i>	CR	-
IRIDACEAE	<i>Geissorhiza inaequalis</i>	Rare	-
IRIDACEAE	<i>Geissorhiza karooica</i>	VU	-
SCROPHULARIACEAE	<i>Globulariopsis wittebergensis</i>	Rare	-
MESEMBRYANTHEMACEAE	<i>Glottiphyllum fergusoniae</i>	NT	-
MESEMBRYANTHEMACEAE	<i>Glottiphyllum linguiforme</i>	VU	-
ASPHODELACEAE	<i>Haworthia fasciata</i>	NT	-
ASTERACEAE	<i>Helichrysum tricostatum</i>	NT	-
APOCYNACEAE	<i>Hoodia pilifera subsp. pilifera</i>	NT	-
IRIDACEAE	<i>Ixia linearifolia</i>	Rare	-
IRIDACEAE	<i>Ixia oxalidiflora</i>	VU	-
IRIDACEAE	<i>Ixia parva</i>	VU	-
IRIDACEAE	<i>Ixia rapunculoides var. flaccida</i>	VU	-
HYACINTHACEAE	<i>Lachenalia martiniae</i>	VU	-
HYACINTHACEAE	<i>Lachenalia maximiliani</i>	Rare	-
MESEMBRYANTHEMACEAE	<i>Lampranthus amoenus</i>	EN	-
PROTEACEAE	<i>Leucadendron teretifolium</i>	NT	-
FABACEAE	<i>Lotononis comptonii</i>	EN	-
FABACEAE	<i>Lotononis densa subsp. congesta</i>	VU	-
FABACEAE	<i>Lotononis gracilifolia</i>	EN	-
FABACEAE	<i>Lotononis venosa</i>	VU	-
IRIDACEAE	<i>Moraea aspera</i>	VU	-
POLYGALACEAE	<i>Muraltia karroica</i>	VU	-
POLYGALACEAE	<i>Muraltia montana</i>	Rare	-
MESEMBRYANTHEMACEAE	<i>Octopoma tanquamum</i>	VU	-
SCROPHULARIACEAE	<i>Oftia glabra</i>	Rare	-
OXALIDACEAE	<i>Oxalis tenuipes var. tenuipes</i>	Rare	-
GERANIACEAE	<i>Pelargonium denticulatum</i>	Rare	-
GERANIACEAE	<i>Pelargonium torulosum</i>	Rare	-
MESEMBRYANTHEMACEAE	<i>Phyllobolus herbertii</i>	VU	-
ASTERACEAE	<i>Phymaspermum schroeteri</i>	Rare	-
PROTEACEAE	<i>Protea convexa</i>	CR	-
PROTEACEAE	<i>Protea lepidocarpodendron</i>	NT	-
ASTERACEAE	<i>Pteronia hutchinsoniana</i>	Rare	-
ASTERACEAE	<i>Relhania tricephala</i>	NT	-
IRIDACEAE	<i>Romulea eburnea</i>	VU	-
MESEMBRYANTHEMACEAE	<i>Ruschia altigena</i>	Rare	-
SCROPHULARIACEAE	<i>Selago albomontana</i>	Rare	-
ASTERACEAE	<i>Senecio scaposus</i>	EN	-

Family	Scientific Name	SA Red List	IUCN Red List
AMARYLLIDACEAE	<i>Strumaria karooica</i>	Rare	-
AMARYLLIDACEAE	<i>Strumaria pubescens</i>	Rare	-
MESEMBRYANTHEMACEAE	<i>Tanquana archeri</i>	VU	-
MESEMBRYANTHEMACEAE	<i>Tanquana hilmarii</i>	CR	-
ASPHODELACEAE	<i>Trachyandra sanguinorhiza</i>	Rare	-
COLCHICACEAE	<i>Wumbea capensis</i>	VU	-

6.1.5 Fauna

Consultation of historical records for the quarter degree square (QDS) (3220CD, 3220DC, 3320AB, 3320BA) and habitat distribution maps indicate potential faunal species of conservation concern that may occur within the site.

Amphibians and Reptiles

Amphibians and reptiles are well represented in sub-Saharan Africa. However, distribution patterns in southern Africa are uneven both in terms of species distribution and in population numbers (du Preez and Carruthers, 2009). Climate, centres of origin and range restrictions are the three main factors that determine species distribution. The eastern coast of South Africa has the highest amphibian diversity and endemism while reptile diversity is generally highest in the north-eastern extremes of South Africa and declines to the south and west (Alexander and Marais, 2010).

There are 350 species of reptile in South Africa, comprising 213 lizards, 9 worm lizards, 105 snakes, 13 terrestrial tortoises, 5 freshwater terrapins, 2 breeding species of sea turtle and 1 crocodile (Branch, 1998). Amphibians are important in wetland systems, particularly where fish are excluded or of minor importance. In these habitats, frogs are dominant predators of invertebrates. Reports of declining amphibian populations continue to increase globally, even in pristine protected areas. These declines are not simple cyclic events; for example, frogs have been identified as bio-indicator species that reflect the wellbeing of aquatic ecosystems. Frog abundance and diversity is a poignant reflection of the general health and well-being of aquatic ecosystems.

According to historical records (SAFAP, 2015), there are five (5) amphibian species likely to occur in the project area. All five species are listed as Schedule II¹¹ species according to the Northern Cape Provincial Nature Conservation Ordinance (PNCO) and the Western Cape PNCO. These are listed in Table 6-4 below.

Table 6-4: Amphibians occurring in the project area and surrounding areas (SAFAP, 2015).

FAMILY	Scientific Name	Common Name	RED DATA STATUS	IUCN	Northern Cape PNCO	Cape Nature (Western Cape)
RANIDAE	<i>Afrana fuscigula</i>	Cape river frog	Least Concern	Least Concern	Schedule II	Schedule II
BUFONIDAE	<i>Bufo garipeensis</i>	Karoo toad	Least Concern	Least Concern	Schedule II	Schedule II
PETROPEDETI DAE	<i>Cacosternum karroicum</i>	Karoo Caco	Data Deficient	-	Schedule II	Schedule II
RANIDAE	<i>Tomopterna delalandii</i>	Delalande's sand frog	Least Concern	Least Concern	Schedule II	Schedule II
PIPIDAE	<i>Xenopus laevis</i>	African clawed frog	Least Concern	Least Concern	Schedule II	Schedule II

Potential impacts of the proposed Brandvalley WEF on the amphibian population may include habitat disturbance. In addition, turbine noise may dull calls and interrupt breeding behaviour.

¹¹ According to the Northern Cape PNCO, Schedule II species are protected species. Whilst in the Western Cape PNCO, Schedule II species are protected wild animals.

According to the Southern African Reptile Conservation Assessment (SARCA, 2016), the historical records for the four (4) QDS areas in which the project area falls into indicate that twenty (20) reptile species are likely to occur in the project area. The Karoo Padloper (*Homopus boulengeri*) is listed as Near Threatened (NT). Two reptile species are not listed while the remaining sixteen (16) are of Least Concern (LC). These are listed in Table 6-5 below. Species Listed as Schedule I¹², II or III¹³ according to the Northern Cape PNCO are also shown in the table below. Fourteen (14) species are listed as Schedule II species in the Western Cape PNCO.

Table 6-5: Reptiles occurring in the project area and surrounding areas according to the Southern African Reptile Conservation Assessment (SARCA, 2016).

FAMILY	Scientific Name	Common Name	Red List Category (SARCA 2014)	IUCN	Northern Cape PNCO	Cape Nature (Western Cape)
AGAMIDAE	<i>Agama atra</i>	Southern Rock Agama	Least Concern	-	-	Schedule II
ELAPIDAE	<i>Aspidelaps lubricus lubricus</i>	Coral Shield Cobra	Not listed	-	Schedule III	-
LAMPROPHIIDAE	<i>Boaedon capensis</i>	Brown House Snake	Least Concern	-	Schedule III	-
TESTUNDINIDAE	<i>Chersina angulata</i>	Angulate Tortoise	Least Concern	-	Schedule II	Schedule II
GEKKONIDAE	<i>Chondrodactylus bibronii</i>	Bibron's Gecko	Least Concern	-	-	Schedule II
COLUBRIDAE	<i>Dasypeltis scabra</i>	Rhombic Egg-eater	Least Concern	Least Concern	Schedule III	Schedule II
COLUBRIDAE	<i>Dipsina multimaculata</i>	Dwarf Beaked Snake	Least Concern	-	Schedule III	-
TESTUNDINIDAE	<i>Homopus boulengeri</i>	Karoo Padloper	Near Threatened	-	Schedule II	Schedule II
CORDYLIDAE	<i>Karusasaurus polyzonus</i>	Karoo Girdled Lizard	Least Concern	-	Schedule I	Schedule II
GEKKONIDAE	<i>Pachydactylus formosus</i>	Southern Rough Gecko	Least Concern	-	-	Schedule II
GEKKONIDAE	<i>Pachydactylus geitje</i>	Ocellated Gecko	Least Concern	-	-	Schedule II
GEKKONIDAE	<i>Pachydactylus mariquensis</i>	Marico Gecko	Least Concern	-	-	Schedule II
LACERTIDAE	<i>Pedioplanis burchelli</i>	Burchell's Sand Lizard	Least Concern	-	-	Schedule II
LACERTIDAE	<i>Pedioplanis lineocellata pulchella</i>	Common Sand Lizard	Least Concern	-	-	Schedule II
LAMPROPHIIDAE	<i>Prosymna sundevallii</i>	Sundevall's Shovel-snout	Least Concern	-	Schedule III	-
TESTUNDINIDAE	<i>Psammobates tentorius tentorius</i>	Karoo Tent Tortoise	Not listed	-	Schedule II	Schedule II
TESTUNDINIDAE	<i>Psammobates tentorius verroxii</i>	Verrox's Tent Tortoise	Not listed	-	Schedule II	Schedule II
LAMPROPHIIDAE	<i>Psammophis notostictus</i>	Karoo Sand Snake	Least Concern	-	Schedule III	-
LAMPROPHIIDAE	<i>Psammophylax rhombeatus rhombeatus</i>	Spotted Grass Snake	Least Concern	-	Schedule III	-
SCINICIDAE	<i>Trachylepis variegata</i>	Variiegated Skink	Least Concern	-	-	Schedule II

The main impact of the proposed Brandvalley WEF on reptile fauna within the project area is through habitat loss, particularly in rocky outcrop areas.

Avifauna

Important Bird Areas (IBAs) – Birdlife International

The Important Bird Areas (IBAs) is a BirdLife International initiative aimed to identify important conservation areas crucial for long-term survival of bird species that are globally threatened, have a restricted range or are restricted to specific biomes and vegetation types. South Africa is part of 101 Global IBAs and 21 Regional IBAs.

¹² According to the Northern Cape PNCO, Schedule I species are specially protected species

¹³ According to the Northern Cape PNCO, Schedule III species are common indigenous species

The selection of IBAs is achieved through the application of quantitative ornithological criteria, grounded in up-to-date knowledge of the sizes and trends of bird populations. The criteria ensures that the sites selected as IBAs have true significance for the international conservation of bird populations, and provide a common currency that all IBAs adhere to, thus creating consistency among, and enabling comparability between, sites at national, continental and global levels.

It is crucial to understand why a site is important, and to do this it is necessary to examine its international significance in terms of the presence and abundance of species that occur there, year round or seasonally. At the global level, a set of four categories and criteria are used to assess the significance of the site.

The global IBA criteria are as follows:

A1. Globally threatened species

- *Criterion: The site is known or thought to hold significant numbers of a globally threatened species, or other species of global conservation concern.*
- The site qualifies if it is known, estimated or thought to hold a population of a species categorized by the IUCN Red List as Critically Endangered (CR), Endangered (EN) or Vulnerable (VU). In general, the regular presence of a Critical or Endangered species, irrespective of population size, at a site may be sufficient for a site to qualify as an IBA. For VU species, the presence of more than threshold numbers at a site is necessary to trigger selection.

A2. Restricted-range species

- *Criterion: The site is known or thought to hold a significant component of a group of species whose breeding distributions define an Endemic Bird Area (EBA) or Secondary Area (SA).*
- This category is for species of EBAs. EBAs are defined as places where two or more species of restricted range, i.e. with world distributions of less than 50 000 km², occur together. More than 70% of such species are also globally threatened. Also included here are species of SAs.

A3. Biome-restricted species

- *Criterion: The site is known or thought to hold a significant component of the group of species whose distributions are largely or wholly confined to one biome.*
- This category applies to groups of species with largely shared distributions of greater than 50,000km², which occur mostly or wholly within all or part of a particular biome and are, therefore, of global importance.

A4. Congregations

- *Criteria: A site may qualify on any one or more of the four criteria listed below:*
 - i. The site is known or thought to hold, on a regular basis, $\geq 1\%$ of a biogeographic population of a congregatory waterbird species.
 - ii. The site is known or thought to hold, on a regular basis, $\geq 1\%$ of the global population of a congregatory seabird or terrestrial species.
 - iii. The site is known or thought to hold, on a regular basis, $\geq 20,000$ waterbirds or $\geq 10,000$ pairs of seabirds of one or more species.
 - iv. The site is known or thought to exceed thresholds set for migratory species at bottleneck sites.

The proposed project is in close proximity to two IBAs, namely the Anysberg Nature Reserve and the Swartberg Mounatins (see Figure 6-8).

IBA 1: Anysberg Nature Reserve

The Anysberg Nature Reserve, covering an area of 82 310ha, is located 30km south of Matjiesfontein and 20km south-west of Laingsburg within the Western Cape Province. There have been 212 bird species recorded within the Anysberg Nature Reserve, including several Fynbos and

Namib-Karoo biome-restricted assemblage species and other arid-zone species. The IBA has a global IBA status and is triggered by five (5) globally threatened species; including the Blue Crane, Ludwig's Bustard, Southern Black Korhaan *Afrotis afra*, Martial Eagle and Black Harrier. Regionally threatened species found in the area include the Karoo Korhaan, Verreaux's Eagle, Black Stork, Lanner Falcon *Falco biarmicus* and Cape Rockjumper. Biome-restricted and restricted-range birds that are common to the IBA include Cape Spurfowl, Cape Bulbul and Karoo Chat. Locally common restricted-range or biome-restricted species are Karoo Lark, Layard's Tit-Babbler, Karoo Eremomela and Namaqua Warbler, while uncommon species in this category are Ludwig's Bustard, Sickle-winged Chat *Cercomela sinuata*, Cape Rockjumper, Victorin's Warbler, Cape Sugarbird, Cape Siskin, Protea Seedeater *Crithagra leucoptera*, Orange-breasted Sunbird, Pale-winged Starling and Black-headed Canary.

The Anysberg Nature Reserve is **Fully Protected** and managed by CapeNature.

IBA 2: Swartberg Mountains

The Swartberg Mountains, covering an area of 179 490ha, is located within the Western Cape and Eastern Cape Provinces, parallel to the Outeniqua Mountains IBA. The IBA comprises of fynbos and karroid endemic species with several restricted-range and biome-restricted assemblage species. There are three (3) globally threatened species found in the area include Martial Eagle, Black Harrier and Hottentot Buttonquail. Regionally threatened species include Verreaux's Eagle, Karoo Korhaan, Lanner Falcon, Cape Rockjumper and African Rock Pipit.

Common restricted-range and biome-restricted species consist of Cape Spurfowl and Cape Bulbul, while locally common species are Cape Sugarbird, Orange-breasted Sunbird, Cape Siskin, Karoo Chat, Layard's Tit-Babbler, Black-headed Canary, Pale-winged Starling and Namaqua Warbler. Uncommon biome-restricted species are Victorin's Warbler *Cryptillas victorini*, Cape Rockjumper, Protea Seedeater, Karoo Lark, Karoo Long-billed Lark, Sickle-winged Chat *Cercomela sinuata* and Karoo Eremomela.

The Swartberg Mountains IBA is **Partially Protected** with several reserves and mountain catchment areas managed by CapeNature found within the IBA.

SKEP - Expert Bird Areas (EBA)

The SKEP initiative, as described in section 6.1.5 above, provides expert knowledge from a number of taxonomic groups (amphibians, birds, fish, invertebrates, plants, reptiles and small mammals) to supplement the data on biodiversity features gained through systematic conservation planning. This data was used to map the areas of unique habitats, endemism and species richness. This tool was used to determine whether the project area is located in close proximity to EBAs as identified by SKEP.

A list of birds that may occur within the project area is provided in Table 6-6 below. Birds will be discussed in greater detail in the Avifauna Impact Assessment conducted as part of the EIA Phase.

Table 6-6: List of bird SSC that may utilise the proposed project area (BirdLife SA, 2010).

Family	Scientific Name	Common Name	IUCN	NEM:BA	Northern Cape SSC	Western Cape SSC
ACCIPITRIDAE	<i>Accipiter rufiventris</i>	Sparrowhawk, Rufous-chested	Least Concern	-	Schedule I	Schedule II
ACROCEPHALIDAE	<i>Acrocephalus baeticatus</i>	Reed-warbler, African	-	-	Schedule II	Schedule II
SYLVIIDAE	<i>Acrocephalus gracilirostris</i>	Swamp-warbler, Lesser	Least Concern	-	Schedule II	Schedule II
SCOLOPACIDAE	<i>Actitis hypoleucos</i>	Sandpiper, Common	Least Concern	-	Schedule II	Schedule II
OTIDIDAE	<i>Afrotis afra</i>	Korhaan, Southern Black	Vulnerable	-	Schedule II	Schedule II
ALCEDINIDAE	<i>Alcedo cristata</i>	Kingfisher, Malachite	-	-	Schedule II	Schedule II
ANATIDAE	<i>Alopochen aegyptiacus</i>	Goose, Egyptian	Least Concern	-	Schedule II	Schedule II
ANATIDAE	<i>Anas capensis</i>	Teal, Cape	Least Concern	-	Schedule II	Schedule II
ANATIDAE	<i>Anas smithii</i>	Shoveler, Cape	Least Concern	-	Schedule II	Schedule II
ANATIDAE	<i>Anas sparsa</i>	Duck, African Black	Least Concern	-	Schedule II	Schedule II
ANATIDAE	<i>Anas undulata</i>	Duck, Yellow-billed	Least Concern	-	Schedule II	Schedule II
REMIZIDAE	<i>Anthoscopus minutus</i>	Penduline-tit, Cape	Least Concern	-	Schedule II	Schedule II
GRUIDAE	<i>Anthropoides paradiseus</i>	Crane, Blue	Vulnerable	Endangered	Schedule II	Schedule II
MOTACILLIDAE	<i>Anthus cinnamomeus</i>	Pipit, African	-	-	Schedule II	Schedule II
MOTACILLIDAE	<i>Anthus similis</i>	Pipit, Long-billed	Least Concern	-	Schedule II	Schedule II
APODIDAE	<i>Apus affinis</i>	Swift, Little	Least Concern	-	Schedule II	Schedule II
APODIDAE	<i>Apus barbatus</i>	Swift, African Black	Least Concern	-	Schedule II	Schedule II
APODIDAE	<i>Apus caffer</i>	Swift, White-rumped	Least Concern	-	Schedule II	Schedule II
ACCIPITRIDAE	<i>Aquila pennatus</i>	Eagle, Booted	-	-	Schedule I	Schedule II
ACCIPITRIDAE	<i>Aquila verreauxii</i>	Eagle, Verreaux's	Least Concern	-	Schedule I	Schedule II
ARDEIDAE	<i>Ardea cinerea</i>	Heron, Grey	Least Concern	-	Schedule II	Schedule II
ARDEIDAE	<i>Ardea melanocephala</i>	Heron, Black-headed	Least Concern	-	Schedule II	Schedule II
PLATYSTEIRIDAE	<i>Batis pririt</i>	Batis, Pririt	Least Concern	-	Schedule II	Schedule II
THRESKIORNITHIDAE	<i>Bostrychia hagedash</i>	Ibis, Hadedash	Least Concern	-	Schedule II	Schedule II
STRIGIDAE	<i>Bubo africanus</i>	Eagle-owl, Spotted	Least Concern	-	Schedule I	Schedule II
ARDEIDAE	<i>Bubulcus ibis</i>	Egret, Cattle	Least Concern	-	Schedule II	Schedule II
BURHINIDAE	<i>Burhinus capensis</i>	Thick-knee, Spotted	Least Concern	-	Schedule II	Schedule II
ACCIPITRIDAE	<i>Buteo vulpinus</i>	Buzzard, Steppe	-	-	Schedule I	Schedule II
ACCIPITRIDAE	<i>Buteo rufofuscus</i>	Buzzard, Jackal	Least Concern	-	Schedule I	Schedule II
ALAUDIDAE	<i>Calandrella cinerea</i>	Lark, Red-capped	Least Concern	-	Schedule II	Schedule II
ALAUDIDAE	<i>Calendulauda albescens</i>	Lark, Karoo	-	-	Schedule II	Schedule II

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Family	Scientific Name	Common Name	IUCN	NEM:BA	Northern Cape	Western Cape
SCOLOPACIDAE	<i>Calidris minuta</i>	Stint, Little	Least Concern	-	Schedule II	Schedule II
CAPRIMULGIDAE	<i>Caprimulgus pectoralis</i>	Nightjar, Fiery-necked	Least Concern	-	Schedule I	Schedule II
MUSCICAPIDAE	<i>Cercomela familiaris</i>	Chat, Familiar	Least Concern	-	Schedule II	Schedule II
MUSCICAPIDAE	<i>Cercomela schlegelii</i>	Chat, Karoo	Least Concern	-	Schedule II	Schedule II
MUSCICAPIDAE	<i>Cercomela sinuata</i>	Chat, Sickle-winged	Least Concern	-	Schedule II	Schedule II
MUSCICAPIDAE	<i>Cercotrichas coryphaeus/ Erythropygia coryphaeus</i>	Scrub-robin, Karoo	Least Concern	-	Schedule II	Schedule II
ALAUDIDAE	<i>Certhilauda subcoronata</i>	Lark, Karoo Long-billed	Least Concern	-	Schedule II	Schedule II
CHARADRIIDAE	<i>Charadrius pecuarius</i>	Plover, Kittlitz's	Least Concern	-	Schedule II	Schedule II
CHARADRIIDAE	<i>Charadrius tricollaris</i>	Plover, Three-banded	Least Concern	-	Schedule II	Schedule II
ALAUDIDAE	<i>Chersomanes albofasciata</i>	Lark, Spike-heeled	Least Concern	-	Schedule II	Schedule II
NECTARINIIDAE	<i>Cinnyris chalybeus</i>	Sunbird, Southern Double-collared	-	-	Schedule II	Schedule II
NECTARINIIDAE	<i>Cinnyris fuscus</i>	Sunbird, Dusky	-	-	Schedule II	Schedule II
ACCIPITRIDAE	<i>Circus maurus</i>	Harrier, Black	Vulnerable	-	Schedule I	Schedule II
CISTICOLIDAE	<i>Cisticola fulvicapilla</i>	Neddicky, Neddicky	Least Concern	-	Schedule II	Schedule II
CISTICOLIDAE	<i>Cisticola subruficapilla</i>	Cisticola, Grey-backed	Least Concern	-	Schedule II	Schedule II
CISTICOLIDAE	<i>Cisticola tinniens</i>	Cisticola, Levillant's	Least Concern	-	Schedule II	Schedule II
COLIIDAE	<i>Colius colius</i>	Mousebird, White-backed	Least Concern	-	Schedule II	-
COLUMBIDAE	<i>Columba guinea</i>	Pigeon, Speckled	Least Concern	-	Schedule II	Schedule II
COLUMBIDAE	<i>Columba livia</i>	Dove, Rock	Least Concern	-	Schedule II	Schedule II
CORVIDAE	<i>Corvus albicollis</i>	Raven, White-necked	Least Concern	-	Schedule II	Schedule II
CORVIDAE	<i>Corvus albus</i>	Crow, Pied	Least Concern	-	Schedule III	Schedule II
MUSCICAPIDAE	<i>Cossypha caffra</i>	Robin-chat, Cape	Least Concern	-	Schedule II	Schedule II
STURNIDAE	<i>Creatophora cinerea</i>	Starling, Wattled	Least Concern	-	Schedule II	Schedule II
FRINGILLIDAE	<i>Crithagra albogularis</i>	Canary, White-throated	-	-	Schedule II	Schedule II
FRINGILLIDAE	<i>Crithagra flaviventris</i>	Canary, Yellow	-	-	Schedule II	Schedule II
PICIDAE	<i>Dendropicus fuscescens</i>	Woodpecker, Cardinal	Least Concern	-	Schedule II	Schedule II
ACCIPITRIDAE	<i>Elanus caeruleus</i>	Kite, Black-shouldered	Least Concern	-	Schedule I	Schedule II
EMBERIZIDAE	<i>Emberiza capensis</i>	Bunting, Cape	Least Concern	-	Schedule II	Schedule II
EMBERIZIDAE	<i>Emberiza impetواني</i>	Bunting, Lark-like	Least Concern	-	Schedule II	Schedule II
SYLVIIDAE	<i>Eremomela gregalis</i>	Eremomela, Karoo	Least Concern	-	Schedule II	Schedule II
SYLVIIDAE	<i>Eremomela icteropygialis</i>	Eremomela, Yellow-bellied	Least Concern	-	Schedule II	Schedule II
ALAUDIDAE	<i>Eremopterix verticalis</i>	Sparrowlark, Grey-backed	Least Concern	-	Schedule II	Schedule II

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Family	Scientific Name	Common Name	IUCN	NEM:BA	Northern Cape	Western Cape
ESTRILDIDAE	<i>Estrilda astrild</i>	Waxbill, Common	Least Concern	-	Schedule II	Schedule II
PLOCEIDAE	<i>Euplectes orix</i>	Bishop, Southern Red	Least Concern	-	Schedule III	-
OTIDIDAE	<i>Eupodotis vigorsii</i>	Korhaan, Karoo	Least Concern	-	Schedule II	Schedule II
FALCONIDAE	<i>Falco rupicolus</i>	Kestrel, Rock	-	-	Schedule I	Schedule II
RALLIDAE	<i>Fulica cristata</i>	Coot, Red-knobbed	Least Concern	-	Schedule II	Schedule II
ALAUDIDAE	<i>Galerida magnirostris</i>	Lark, Large-billed	Least Concern	-	Schedule II	Schedule II
RALLIDAE	<i>Gallinula chloropus</i>	Moorhen, Common	Least Concern	-	Schedule II	Schedule II
PICIDAE	<i>Geocolaptes olivaceus</i>	Woodpecker, Ground	Least Concern	-	Schedule II	Schedule II
RECURVIROSTRIDAE	<i>Himantopus himantopus</i>	Stilt, Black-winged	Least Concern	-	Schedule II	Schedule II
HIRUNDINIDAE	<i>Hirundo albigularis</i>	Swallow, White-throated	Least Concern	-	Schedule II	Schedule II
HIRUNDINIDAE	<i>Hirundo cucullata</i>	Swallow, Greater Striped	Least Concern	-	Schedule II	Schedule II
HIRUNDINIDAE	<i>Hirundo fuligula</i>	Martin, Rock	Least Concern	-	Schedule II	Schedule II
HIRUNDINIDAE	<i>Hirundo rustica</i>	Swallow, Barn	Least Concern	-	Schedule II	Schedule II
INDICATORIDAE	<i>Indicator minor</i>	Honeyguide, Lesser	Least Concern	-	Schedule II	Schedule II
LANIIDAE	<i>Lanius collaris</i>	Fiscal, Common (Southern)	Least Concern	-	Schedule II	Schedule II
CISTICOLIDAE	<i>Malcorus pectoralis</i>	Warbler, Rufous-eared	Least Concern	-	Schedule II	Schedule II
ACCIPITRIDAE	<i>Melierax canorus</i>	Goshawk, Southern Pale Chanting	Least Concern	-	Schedule I	Schedule II
MEROPIIDAE	<i>Merops apiaster</i>	Bee-eater, European	Least Concern	-	Schedule II	Schedule II
ALAUDIDAE	<i>Mirafra fasciolata</i>	Lark, Eastern Clapper	-	-	Schedule II	Schedule II
ALAUDIDAE	<i>Mirafra apiata</i>	Lark, Cape Clapper	Least Concern	-	Schedule II	Schedule II
MOTACILLIDAE	<i>Motacilla capensis</i>	Wagtail, Cape	Least Concern	-	Schedule II	Schedule II
MUSCICAPIDAE	<i>Muscicapa striata</i>	Flycatcher, Spotted	Least Concern	-	Schedule II	Schedule II
MUSCICAPIDAE	<i>Myrmecocichla formicivora</i>	Chat, Anteating	Least Concern	-	Schedule II	Schedule II
NECTARINIIDAE	<i>Nectarinia famosa</i>	Sunbird, Malachite	Least Concern	-	Schedule II	Schedule II
OTIDIDAE	<i>Neotis ludwigii</i>	Bustard, Ludwig's	Endangered	Vulnerable	Schedule I	Schedule II
NUMIDIDAE	<i>Numida meleagris</i>	Guineafowl, Helmeted	Least Concern	-	Schedule II	Schedule II
COLUMBIDAE	<i>Oena capensis</i>	Dove, Namaqua	Least Concern	-	Schedule II	Schedule II
MUSCICAPIDAE	<i>Oenanthe monticola</i>	Wheatear, Mountain	Least Concern	-	Schedule II	Schedule II
MUSCICAPIDAE	<i>Oenanthe pileata</i>	Wheatear, Capped	Least Concern	-	Schedule II	Schedule II
STURNIDAE	<i>Onychognathus morio</i>	Starling, Red-winged	Least Concern	-	Schedule III	-
STURNIDAE	<i>Onychognathus nabouroup</i>	Starling, Pale-winged	Least Concern	-	Schedule II	Schedule II
SYLVIIDAE	<i>Parisoma subcaeruleum</i>	Tit-babbler, Chestnut-vented		-	Schedule II	Schedule II

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Family	Scientific Name	Common Name	IUCN	NEM:BA	Northern Cape	Western Cape
SYLVIIDAE	<i>Parisoma layardi</i>	Tit-babbler, Layard's		-	Schedule II	Schedule II
PARIDAE	<i>Parus afer</i>	Tit, Grey	Least Concern	-	Schedule II	Schedule II
PASSERIDAE	<i>Passer diffusus</i>	Sparrow, Southern Grey-headed	Least Concern	-	Schedule II	Schedule II
PASSERIDAE	<i>Passer domesticus</i>	Sparrow, House	Least Concern	-	Schedule III	-
PASSERIDAE	<i>Passer melanurus</i>	Sparrow, Cape	Least Concern	-	Schedule III	-
PHALACROCORACIDAE	<i>Phalacrocorax africanus</i>	Cormorant, Reed	Least Concern	-	Schedule II	Schedule II
PHALACROCORACIDAE	<i>Phalacrocorax carbo</i>	Cormorant, White-breasted	Least Concern	-	Schedule II	Schedule II
CISTICOLIDAE	<i>Phragmacia substriata</i>	Warbler, Namaqua	Least Concern	-	Schedule II	Schedule II
THRESKIORNITHIDAE	<i>Platalea alba</i>	Spoonbill, African	Least Concern	-	Schedule II	Schedule II
ANATIDAE	<i>Plectropterus gambensis</i>	Goose, Spur-winged	Least Concern	-	Schedule II	Schedule II
THRESKIORNITHIDAE	<i>Plegadis falcinellus</i>	Ibis, Glossy	Least Concern	-	Schedule II	Schedule II
PLOCEIDAE	<i>Ploceus capensis</i>	Weaver, Cape	Least Concern	-	Schedule II	-
PLOCEIDAE	<i>Ploceus velatus</i>	Masked-weaver, Southern	Least Concern	-	Schedule II	-
ACCIPITRIDAE	<i>Polemaetus bellicosus</i>	Eagle, Martial	Vulnerable	Vulnerable		Schedule II
CISTICOLIDAE	<i>Prinia maculosa</i>	Prinia, Karoo	Least Concern	-	Schedule II	Schedule II
PHASIANIDAE	<i>Pternistis capensis</i>	Spurfowl, Cape	Least Concern	-	Schedule II	Schedule II
PTEROCLIDIDAE	<i>Pterocles namaqua</i>	Sandgrouse, Namaqua	Least Concern	-	Schedule II	Schedule II
PYCNONOTIDAE	<i>Pycnonotus capensis</i>	Bulbul, Cape	Least Concern	-	Schedule III	-
RALLIDAE	<i>Rallus caerulescens</i>	Rail, African	Least Concern	-	Schedule II	Schedule II
GLAREOLIDAE	<i>Rhinoptilus africanus/ Smutsornis africanus</i>	Courser, Double-banded	Least Concern	-	Schedule II	Schedule II
HIRUNDINIDAE	<i>Riparia paludicola</i>	Martin, Brown-throated	Least Concern	-	Schedule II	Schedule II
PHASIANIDAE	<i>Scleroptila africanus/Scleroptila afra</i>	Francolin, Grey-winged	Least Concern	-	Schedule II	Schedule II
SCOPIIDAE	<i>Scopus umbretta</i>	Hamerkop, Hamerkop	Least Concern	-	Schedule II	Schedule II
FRINGILLIDAE	<i>Serinus alario</i>	Canary, Black-headed	Least Concern	-	Schedule II	Schedule II
FRINGILLIDAE	<i>Serinus canicollis</i>	Canary, Cape	Least Concern	-	Schedule II	Schedule II
MUSCICAPIDAE	<i>Sigelus silens</i>	Flycatcher, Fiscal	Least Concern	-	Schedule II	Schedule II
STURNIDAE	<i>Spreo bicolor</i>	Starling, Pied	Least Concern	-	Schedule II	Schedule II
MUSCICAPIDAE	<i>Stenostira scita</i>	Flycatcher, Fairy	Least Concern	-	Schedule II	Schedule II
COLUMBIDAE	<i>Streptopelia senegalensis</i>	Dove, Laughing	Least Concern	-	Schedule II	Schedule II
COLUMBIDAE	<i>Streptopelia capicola</i>	Turtle-dove, Cape	Least Concern	-	Schedule II	Schedule II
COLUMBIDAE	<i>Streptopelia semitorquata</i>	Dove, Red-eyed	Least Concern	-	Schedule II	Schedule II
STURNIDAE	<i>Sturnus vulgaris</i>	Starling, Common	Least Concern	-	Schedule VI	-

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Family	Scientific Name	Common Name	IUCN	NEM:BA	Northern Cape Biodiversity	Western Cape Biodiversity
SYLVIIDAE	<i>Sylvietta rufescens</i>	Crombec, Long-billed	Least Concern	-	Schedule II	Schedule II
PODICIPEDIDAE	<i>Tachybaptus ruficollis</i>	Grebe, Little	Least Concern	-	Schedule II	Schedule II
APODIDAE	<i>Tachymartitis melba</i>	Swift, Alpine	Least Concern	-	Schedule II	Schedule II
ANATIDAE	<i>Tadorna cana</i>	Shelduck, South African	Least Concern	-	Schedule II	Schedule II
MALACONOTIDAE	<i>Telophorus zeylonus</i>	Bokmakierie, Bokmakierie	Least Concern	-	Schedule II	Schedule II
THRESKIORNITHIDAE	<i>Threskiornis aethiopicus</i>	Ibis, African Sacred	Least Concern	-	Schedule II	Schedule II
RAMPHASTIDAE	<i>Tricholaema leucomelas</i>	Barbet, Acacia Pied	Least Concern	-	Schedule II	Schedule II
SCOLOPACIDAE	<i>Tringa nebularia</i>	Greenshank, Common	Least Concern	-	Schedule II	Schedule II
TURDIDAE	<i>Turdus smithi</i>	Thrush, Karoo	-	-	Schedule II	Schedule II
TURDIDAE	<i>Turdus olivaceus</i>	Thrush, Olive	Least Concern	-	Schedule II	Schedule II
TYTONIDAE	<i>Tyto alba</i>	Owl, Barn	Least Concern	-	Schedule I	Schedule II
UPUPIDAE	<i>Upupa africana</i>	Hoopoe, African	-	-	Schedule II	Schedule II
COLIIDAE	<i>Urocolius indicus</i>	Mousebird, Red-faced	Least Concern	-	Schedule III	Schedule II
CHARADRIIDAE	<i>Vanellus armatus</i>	Lapwing, Blacksmith	Least Concern	-	Schedule II	Schedule II
CHARADRIIDAE	<i>Vanellus coronatus</i>	Lapwing, Crowned	Least Concern	-	Schedule II	Schedule II
ZOSTEROPIIDAE	<i>Zosterops virens</i>	White-eye, Cape	-	-	Schedule II	Schedule II

Figure 6-8 below provides the location of the project area in relation to IBAs and SKEP EBAs. **The project area does not fall within an IBA or a SKEP Expert Bird Area. There are, however IBAs and SKEP Expert Bird Areas located relatively close to the project area.** There is an IBA and a SKEP EBA located south of the project area, within the Anysberg Nature Reserve, and a SKEP EBA located north of the site, along the edge of Roggeveld Escarpment and the Overberg Pass and an IBA and SKEP EBA location south-east of the project area in the Swartberg Mountains.

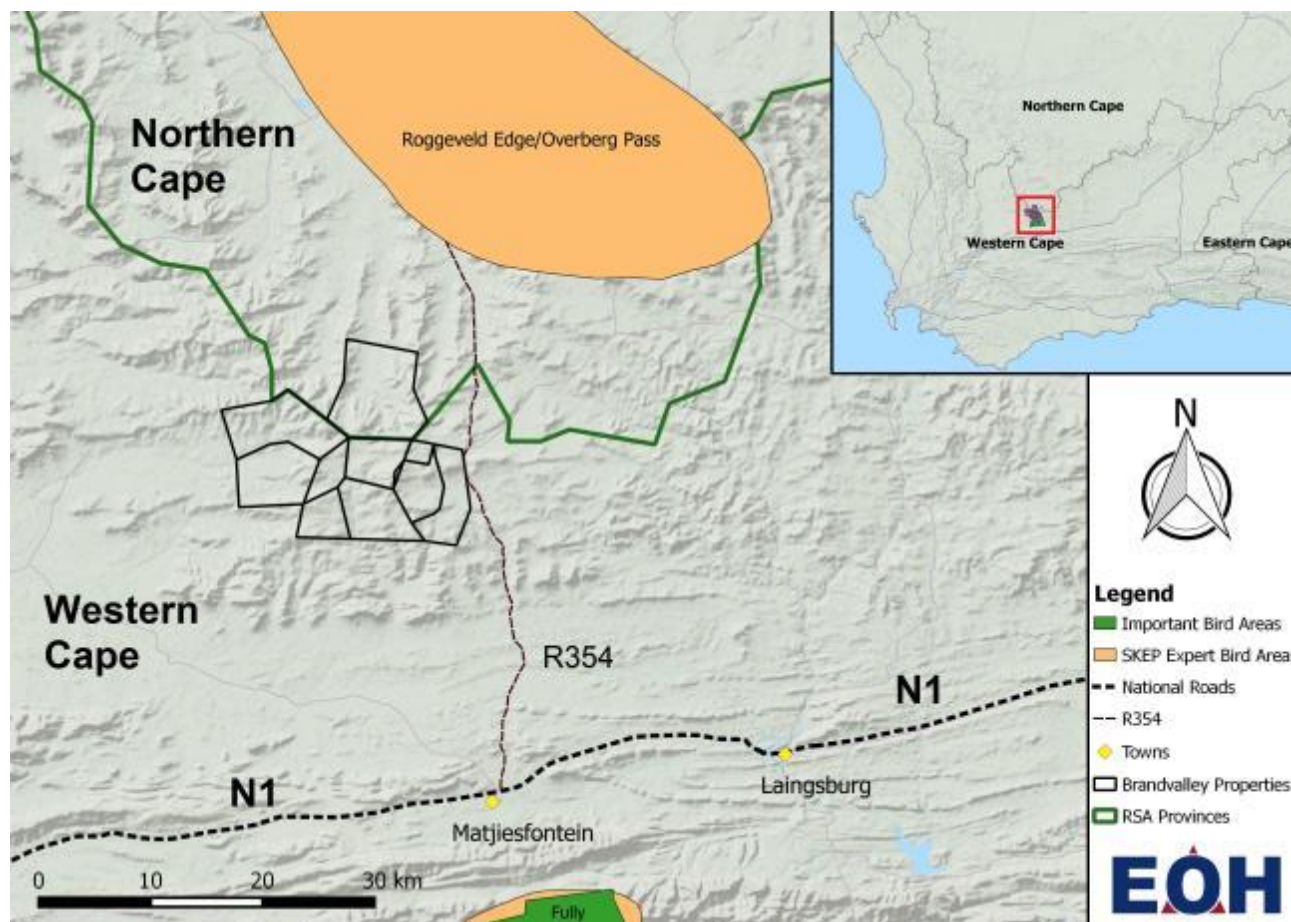


Figure 6-8: IBAs and SKEP EBAs north and south of the proposed project area

Several birds of conservation importance occur in the project area which includes: one (1) Endangered species (*Neotis ludwigii* (the Ludwig's Bustard)), four (4) Vulnerable species (*Afrotis afra* (the Southern Black Korhaan), *Anthropoides paradiseus* (the Blue Crane), *Polemaetus bellicosus* (the Martial Eagle), *Circus maurus* (the Black Harrier) (IUCN 2016). According to NEM:BA the Blue Crane is listed as Endangered and the Martial Eagle and the Ludwig's Bustard are listed as Vulnerable. Thirteen (13) species are listed as Schedule II, seven (7) as schedule III and one as a Schedule VI species in the Northern Cape PNCO. A hundred and thirty four (134) species are listed as Schedule II species in the Western Cape PNCO.

Mammals (Excluding Bats)

Large game makes up less than 15% of the mammal species in South Africa and a much smaller percentage in numbers and biomass. In developed and farming areas this percentage is greatly reduced, with the vast majority of mammals present being small or medium-sized.

The conservation status of South African mammals has recently been re-assessed and a number of species have been downgraded, for example, the African wildcat, Aardvark, Blue duiker, and Honey badger are no longer considered threatened. According to NEM:BA, three protected mammal species (the Black-footed Cat (*Felis nigripes*), the Honey Badger (*Mellivora capensis*) and the Cape Fox (*Vulpes chama*)) and one species listed as Vulnerable (the Leopard (*Panthera*

pardus) have distributions that coincide with the project area (Table 6-7).

According to the IUCN red list, the White tailed mouse which has a distribution that coincide with the project area is listed as EN, the Black-footed Cat (*Felis nigripes*) is listed as VU and the Leopard (*Panthera pardus*) is Near Threatened.

There are ten bird species that may occur in the project area that are listed as Schedule II on the Western Cape PNCO, whilst according to the Northern Cape PNCO, six species are listed as Schedule I and two are listed as Schedule II.

Table 6-7: Mammal species (excluding bats) that have a distribution coinciding with the project area (Stuart and Stuart, 2007).¹⁴

Family	Scientific Name	Common name	IUCN	NEM:BA	Northern Cape PNCO	Nature Conservation Ordinance (Western Cape)
MURIDAE	<i>Acomys subspinosus</i>	Cape Spiny Mouse	Least Concern	-	-	-
MUSTELIDAE	<i>Aonyx capensis</i>	African Clawless Otter	Least Concern	-	-	-
HERPESTIDAE	<i>Atilax paludinosus</i>	Marsh Mongoose	Least Concern	-	-	-
CANIDAE	<i>Canis mesomelas</i>	Black-backed Jackal	Least Concern	-	-	-
FELIDAE	<i>Caracal caracal</i>	African Caracal	Least Concern	-	-	-
SORICIDAE	<i>Crocidura cyanea</i>	Reddish-gray Musk Shrew	Least Concern	-	Schedule II	Schedule II
BATHYERGIDAE	<i>Cryptomys hottentotus</i>	African Mole Rat	Least Concern	-	-	-
HERPESTIDAE	<i>Cynictis penicillata</i>	Yellow Mongoose	Least Concern	-	-	-
NESOMYIDAE	<i>Dendromus melanotis</i>	Gray African Climbing Mouse	Least Concern	-	-	-
MACROSCOLIDIDAE	<i>Elephantulus edwardii</i>	Cape Rock Elephant-shrew	Least Concern	-	-	Schedule II
FELIDAE	<i>Felis nigripes</i>	Black-footed Cat	Vulnerable	Protected Species	Schedule I	Schedule II
FELIDAE	<i>Felis silvestris</i>	Wildcat, Wild Cat	Least Concern	-	Schedule I	-
	<i>Fesmodillus auricularis</i>		-	-	-	-
GALERELLA	<i>Galerella pulverulenta</i>	Cape grey mongoose	-	-	-	-
VIVERRIDAE	<i>Genetta genetta</i>	Common Genet	Least Concern	-	-	-
MURIDAE	<i>Gerbillurus paeba</i>	Hairy-footed Gerbil	Least Concern	-	-	-
GLIRIDAE	<i>Graphiurus ocellatus</i>	Spectacled Dormouse	Least Concern	-	-	-
HYSTRICIDAE	<i>Hystrix africaeastralis</i>	Cape Porcupine	Least Concern	-	-	-
MUSTELIDAE	<i>Ictonyx striatus</i>	Striped Polecat	Least Concern	-	Schedule I	-
LEPORIDAE	<i>Lepus capensis</i>	Cape Hare	Least Concern	-	-	-
LEPORIDAE	<i>Lepus saxatilis</i>	Scrub Hare	Least Concern	-	-	-
MACROSCOLIDIDAE	<i>Macroscelides proboscideus</i>	Namib Round-eared Elephant-shrew	Least Concern	-	-	Schedule II
NESOMYIDAE	<i>Malacothrix typica</i>	Gerbil Mouse	Least Concern	-	-	-
MUSTELIDAE	<i>Mellivora capensis</i>	Honey Badger	Least Concern	Protected Species	-	Schedule II
MURIDAE	<i>Micaelamys granti</i>	Grant's rock rat	-	-	-	-
MURIDAE	<i>Micaelamys namaquensis</i>	Namaqua rock rat	-	-	-	-
MURIDAE	<i>Mus minutoides</i>	Pygmy Mouse	Least Concern	-	-	-
MURIDAE	<i>Mus musculus</i>	House Mouse	Least Concern	-	-	-

¹⁴ Species List was assessed against IUCN Red List, NEM: BA, the Northern Cape PNCO and Western Cape PNCO.

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Family	Scientific Name	Common name	IUCN	NEM:BA	Northern Cape NCC	Nature Conservation Ordinance (Western Cape)
SORICIDAE	<i>Mysorex varius</i>	Forest shrew	-	-	Schedule II	Schedule II
NESOMYIDAE	<i>Mystromys albicaudatus</i>	White-tailed Mouse	Endangered	-	-	-
ORYCTEROPODIDAE	<i>Orycteropus afer</i>	Aardvark, Antbear	Least Concern	-	-	-
CANIDAE	<i>Otocyon megalotis</i>	Bat-eared Fox	Least Concern	-	Schedule I	Schedule II
MURIDAE	<i>Otomys irroratus</i>	Southern African Vlei Rat	Least Concern	-	-	-
MURIDAE	<i>Otomys unisulcatus</i>	Bush Vlei Rat	Least Concern	-	-	-
FELIDAE	<i>Panthera pardus</i>	Leopard	Near Threatened	Vulnerable	Schedule I	Schedule II
CERCOPITHECIDAE	<i>Papio ursinus</i>	Chacma Baboon	Least Concern	-	-	-
MURIDAE	<i>Parotomys brantsii</i>	Brants's Whistling Rat	Least Concern	-	-	-
BOVIDAE	<i>Pelea capreolus</i>	Common Rhebok	Least Concern	-	-	-
PROCAVIIDAE	<i>Procavia capensis</i>	Rock Dassie	Least Concern	-	-	-
LEPORIDAE	<i>Pronolagus rupestris</i>	Smith's Red Rock Hare	Least Concern	-	-	-
LEPORIDAE	<i>Pronolagus saundersiae</i>	Hewitt's Red Rock Hare	Least Concern	-	-	-
HYAENIDAE	<i>Protelas cristatus</i>	Aardwolf	Least Concern	-	Schedule I	Schedule II
BOVIDAE	<i>Raphicerus campestris</i>	Steenbok	Least Concern	-	-	Schedule II
MURIDAE	<i>Rhabdomys pumilio</i>	Four-striped Grass Mouse	Least Concern	-	-	-
HERPESTIDAE	<i>Suricata suricatta</i>	Meerkat	Least Concern	-	-	-
BOVIDAE	<i>Sylvicapra grimmia</i>	Common duiker	-	-	-	Schedule II
BOVIDAE	<i>Tragelaphus strepsiceros</i>	Greater Kudu	Least Concern	-	-	-
CANIDAE	<i>Vulpes chama</i>	Cape Fox	Least Concern	Protected Species	-	Schedule II

Bats

A confounding number of bat fatalities have been found at the bases of wind turbines throughout the world. Echolocating bats should be able to detect moving objects better than stationary ones, questioning the common occurrence of bat deaths caused by wind turbines. Bat fatalities at wind power facilities are highly variable throughout the year, but there are commonly more bat fatalities than bird fatalities at WEFs (Brinkman *et al.*, 2006). Importantly, bat studies have been done in Europe and the United States of America, but little has been conducted in South Africa. These studies have found that even a few deaths can be seriously detrimental to bat populations, and is thus cause for concern (Hotker *et al.*, 2006). Most bats are struck during periods of migration or dispersal (Hotker *et al.*, 2006; Johnson *et al.*, 2003). Horn *et al.* (2008) conducted a study on the behavioural responses of bats to wind turbines and discovered the following:

- *Bats actively forage near operating turbines*
- *Bats approach both rotating and non-rotating blades*
- *Bats followed or were trapped in blade-tip vortices*
- *Bats investigated the various parts of the turbine with repeated fly-bys*
- *Bats were struck directly by rotating blades*

These behavioural responses of bats to wind turbines explains why many of them are killed, however, there are additional explanations for this behaviour. There are several reasons proposed for the number of bat fatalities, one is that the turbines attract insects, and thus foraging insect-eating bats (Ahlen 2003, Kunz *et al.* 2007). Alternatively, bats may mistake turbines for trees when they are looking for a roost, or be acoustically attracted to the wind turbines (Kunz *et al.* 2007). The cause of death is not entirely explained by collision with turbine blades, but instead is caused by internal haemorrhaging. Most bats are killed by barotrauma, which is caused when bats enter low pressure air zones created by turning wind blades fatally affecting their respiratory system. Barotrauma “involves tissue damage to air-containing structures caused by rapid or excessive pressure change”.

The bats species list was run through the IUCN, NEM:BA and PNCO databases. All the bat species with distributions that occur within the project area are listed as Schedule II species according to both the Northern Cape and Western Cape PNCO and only the Common Bentwing Bat (*Miniopterus schreibersii*) is listed as Near Threatened according to IUCN (Table 6-8).

Table 6-8: Showing bat species that have a distribution which co-insides with the project area (Stuart and Stuart, 2007). Species List was assessed against IUCN Red List, NEM: BA, Northern Cape PNCO and Western Cape PNCO.

Family	Scientific Name	Common name	IUCN Red List	NEMBA	Northern	WC PNCO
Vespertilionidae	<i>Eptesicus hottentotus</i>	Long-tailed House	Least Concern	-	Schedule II	Schedule II
Vespertilionidae	<i>Miniopterus</i>	Common Bentwing	Near Threatened	-	Schedule II	Schedule II
Vespertilionidae	<i>Myotis tricolor</i>	Cape Hairy Bat	Least Concern	-	Schedule II	Schedule II
Vespertilionidae	<i>Neoromicia capensis</i>	Cape Bat	Least Concern	-	Schedule II	Schedule II
Nycteridae	<i>Nycteris thebaica</i>	Egyptian Slit-faced	Least Concern	-	Schedule II	Schedule II
Rhinolophidae	<i>Rhinolophus capensis</i>	Cape Horseshoe Bat	Least Concern	-	Schedule II	Schedule II
Rhinolophidae	<i>Rhinolophus clivosus</i>	Geoffroy's	Least Concern	-	Schedule II	Schedule II
Molossidae	<i>Tadarida aegyptiaca</i>	Egyptian Free-tailed	Least Concern	-	Schedule II	Schedule II

6.1.6 Conservation and planning tools

Several conservation planning tools are available for the area to inform land-use planning, environmental assessments and authorisations and natural resource management in order to promote sustainable development. These tools allow for the determination of any sensitive and important areas from a vegetation and faunal point of view at the scoping stage of a development. They allow for the fine-tuning of plans and turbine layouts with a view to reducing potential environmental impacts at the planning stage of the development. The tools used are outlined in Table 6-9 below.

Table 6-9: Conservation and planning tools considered for the proposed project.

Tool	Motivation	Relevancy	Notes
NATIONAL			
Protected Areas National Environmental Management: Protected Areas (Act No. 57 of 2003)	Protected areas are areas that are already conserved. Areas in close proximity to the proposed development may be affected by the development and thus must be taken into account.	Low relevancy. No protected areas occur within approximately 20km of the site.	There are no protected areas within 20km of the site.
National Protected Areas Expansion Strategy (NPAES)	The objective of the NPAES is to form an overarching strategic framework for a protected area network that 'conserves a comprehensive, representative and adequate sample of biodiversity and maintains key ecological processes across the landscape and seascape.' The areas earmarked by this study should be protected.	Relevant. The project area does not fall within a protected area; however it does fall within NPAES focus areas of the Western Karoo.	This will be discussed in brief in the Ecological Impact Assessment to be carried out in the EIA phase.
IBA	IBAs are globally recognized areas essential for the protection of bird species. In order to be classified as an IBA, an area must contain Globally threatened species, restricted range species, biome restricted species or congregations of species.	Relevant. The project area is approximately 40km from Anysberg Nature Reserve IBA.	An avifauna impact assessment in the EIA phase will determine the impacts of the proposed facility on birds along with 12 months of bird monitoring.
SKEP	SKEP is a bi-regional and development programme for Namibia and South Africa implemented for conservation of these ecosystems. Priority areas are identified to have conservation value and are most vulnerable.	Relevant. The project area is approximately 12km from Roggeveld Edge/Overberg Pass SKEP Bird Areas. SKEP vegetation groups are identified within the area.	Avifaunal and ecological impact assessments conducted in the EIA phase will determine the impacts of the proposed facility on birds and vegetation.
National Wetlands Inventory Guideline Document	Wetlands are very important aspects of the ecosystem as they are process areas. Not only do they form habitat for both flora and fauna, they also perform vital ecosystem functions. It is for this reason that wetlands are always rated with a high sensitivity and should be conserved.	Relevant. There are important wetlands within the project area which should be protected. In addition, a pan has been noted to occur within the project boundary. The cables and access roads are likely to cross at least one watercourse.	Wetlands will be discussed in more detail in the Ecological Impact Assessment in the EIA phase.
National List of Ecosystems that are Threatened and in need of Protection. (NEM:BA) NEM:BA includes a National list of ecosystems that are threatened and in need of protection.	The NEM:BA provides a list of threatened terrestrial ecosystems. This has been established as little attention has historically been paid to the protection of ecosystems outside of protected areas. The purpose of listing threatened ecosystems is primarily to reduce the rate of ecosystem and species extinction. This includes preventing further degradation and loss of structure, function and composition of threatened ecosystems.	Low Relevant. No threatened ecosystems occur within the project area.	There were no threatened terrestrial ecosystems identified within the project area. However, this will be further investigated and confirmed in the Ecological Impact Assessment to be carried out in the EIA phase.
National Freshwater Ecosystem Priority Areas (NFEPA) Guideline Document	A nationwide strategy developed for the protection of freshwater biodiversity defined all of South Africa's freshwater ecosystems according to their contribution to biodiversity, their risk of loss, and by considering both these variables- their need for protection.	Relevant. There are wetlands and rivers of NFEPA status found within the project area.	The impact of the proposed project on these freshwater ecosystems will be assessed in the Ecological Impact Assessment.
PROVINCIAL/MUNICIPAL			
Namakwa District Biodiversity Sector Plan	The Namakwa District Biodiversity Sector Plan aims to identify unique biodiversity areas and increase protection of these areas through the increase of awareness of these areas and the value the biodiversity represents to people. The plan, together with other land-use guidelines, provide a common reference to Critical Biodiversity Areas (CBAs) in the Namakwa DM.	Relevant. The project area falls within the Namakwa District and thus development must be in accordance with the plan.	The plan will be considered throughout the EIA.

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Cape Action for People and the Environment (C.A.P.E)	C.A.P.E is an initiative to promote conservation planning and implementation within the Cape Floristic Region (CFR). The CFR is the smallest and richest of the six floral kingdoms in the world, with its biodiversity largely under threat. The C.A.P.E has identified key threats and causes of biodiversity losses that need to be addressed in order to protect the floral kingdom. C.A.P.E has mapped and described the vegetation in the area with aims to conserve and restore the biodiversity of the region while at the same time delivering significant benefits to the people of the region through a partnership between government and the public.	Relevant. The project area occurs within the Fynbos and Karoo broad habitat unit. According to C.A.P.E two vegetation types occur within the study area; <ul style="list-style-type: none"> • The Roggeveld Inland Renosterveld; and • Western Mountain Vygieveld. (Only small portions found in the northern portion and borders the project in the western region) This area does not fall within the grid categories in the C.A.P.E irreplaceability layer.	The proposed area does not fall within the C.A.P.E. priority areas, however the guiding document will be considered throughout the proposed project to ensure that biodiversity is conserved where possible.
Namakwa District Municipality Integrated Development Plan (IDP) 2012- 2016	The IDP aims to assist development within the District by providing guidelines and development objectives. The strategic plan guides the planning, budgeting, implementation, management and decision making process within the municipality.	Relevant: The objectives of the IDP are in line with the NDP to drive renewable energy initiatives to meet energy-efficient standards and transition to a less carbon-intensive electricity production.	The production of wind energy is in line with the renewable resources objectives of the municipal IDP and the NDP.
Critical Biodiversity Areas (CBAs) & Ecological Support Areas (ESA) of the Western Cape	2010 Western Cape Biodiversity Framework: CBAs and ESAs of the Western Cape; the Witzenberg Municipality Critical Biodiversity Areas; and the Central Karoo District Municipality, including Cape Winelands District Municipal Area, Biodiversity Assessment provides the CBAs for the Central Karoo District Municipality and the Cape Winelands District Municipality within the Western Cape Province.	Relevant: the project area falls within an ESA and a CBA, in terms of the Cape District Municipality District Municipality Biodiversity Assessment; a CBA of T2 status as per the Namakwa District Municipality CBAs and an ESA and CBA as identified by the Central Karoo District Municipality Biodiversity Assessment.	CBAs and ESAs represent the biodiversity priority areas to be maintained in a natural to near natural state. Other natural remaining areas and no natural remaining areas are not considered as priority areas and a loss of biodiversity within these areas may be acceptable.
Cape Winelands District Municipality Integrated Development Plan (IDP) 2012 - 2016	The IDP aims to assist development within the district by providing guidelines and development objectives. The strategic plan guides the planning, budgeting, implementation, management and decision making process within the municipality.	Relevant: The objectives of the IDP are in line with the NDP to drive renewable energy initiatives to meet energy-efficient standards and transition to a less carbon-intensive electricity production.	The production of wind energy is in line with the renewable resources objectives of the municipal IDP and the NDP.
Central Karoo Integrated Development Plan (IDP) 2012 - 2017	The IDP aims to assist development within the District by providing guidelines and development objectives. The strategic plan guides the planning, budgeting, implementation, management and decision making process within the municipality.	Relevant: The objectives of the IDP are in line with the NDP to drive renewable energy initiatives to meet energy-efficient standards and transition to a less carbon-intensive electricity production.	The production of wind energy is in line with the renewable resources objectives of the municipal IDP and the NDP.

A brief description of these relevant conservation tools and strategies is provided below. The implications of the project on these conservation planning objectives, and the implications these hold for the project, will be subject to further discussion and assessment during the EIA phase. The intention of the Scoping Phase will be to secure as much relevant comment and direction from associated government agencies and line function departments to place the project within the appropriate contexts and prescriptions of these tools.

National Protected Areas Expansion Strategy (NPAES)

A National Spatial Biodiversity Assessment was conducted in 2004, revealing a lack of protection for a representative sample of the country's biodiversity and ecological processes. The NPAES allows for increased conservation of the country's ecological processes in order to meet national biodiversity targets and achieve ecological sustainability. The strategy provides two methods of expanding the current National Protected Areas and highlights ways in which we can become more efficient and effective in natural resource allocation, including (Government of South Africa, 2010):

- The declaration of available, under-utilised and strategic parcels of public land in concordance with the relevant legal requirements for disposal of such land; and
- Implementing contractual agreements with the affected landowners of private land.

An area is considered important for expansion if it contributes to meeting biodiversity thresholds, maintaining ecological processes or climate change resilience. Forty-two (42) focus areas for land-based protected area expansion have been identified and are composed of large, intact areas suitable for the creation or expansion of large protected areas. NPAES sets targets for protected area expansion and provides recommendations procedures for achieving increased protection of identified areas

The project area does not fall within a protected area; however it does fall within the Western Karoo NPAES focus areas of the Western Karoo (Figure 6-9). The impact of the WEF on this will be assessed by the ecological impact assessment.

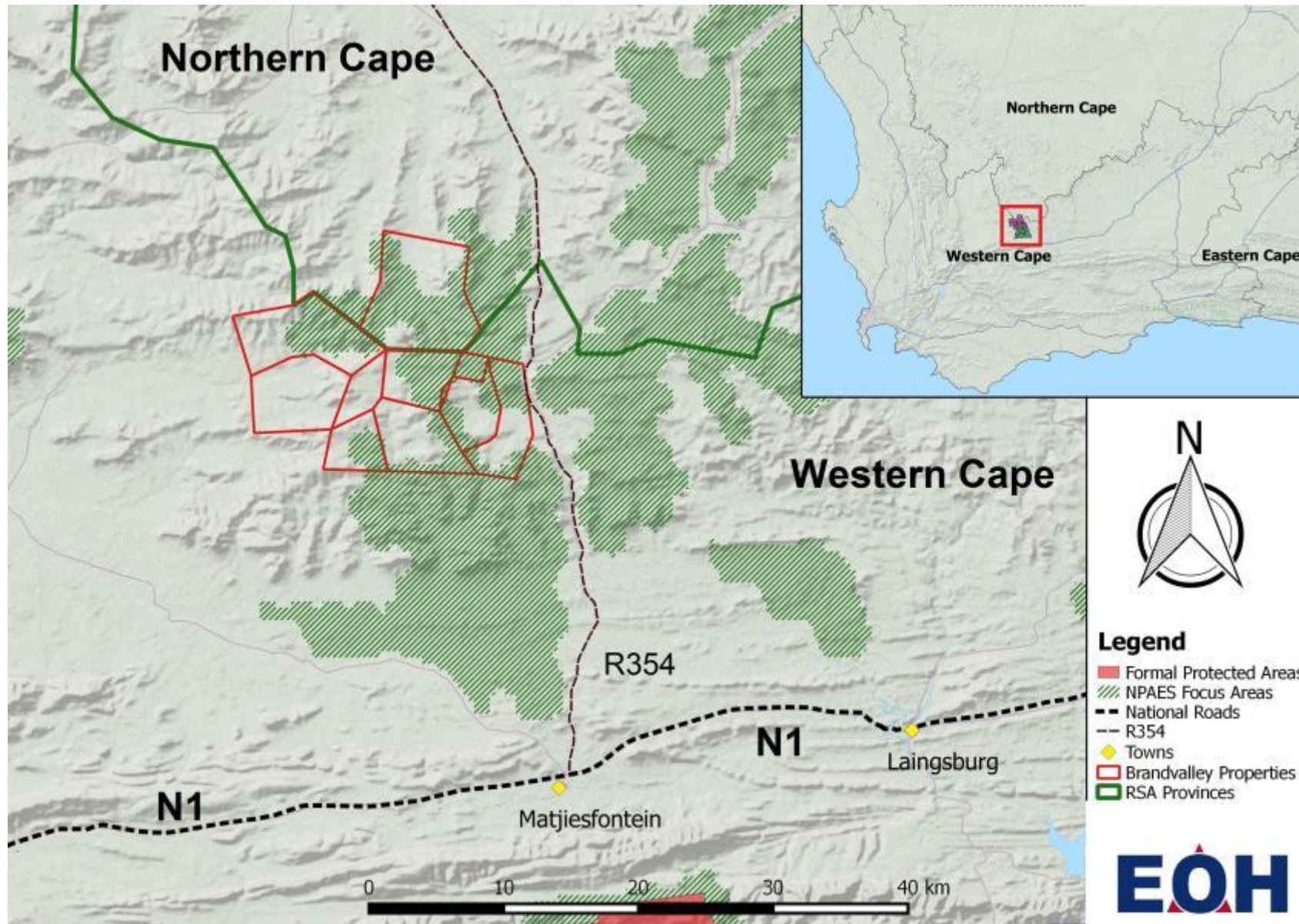


Figure 6-9: National Protected Area Expansion Project Focus Areas surrounding the proposed project area.

National Freshwater Ecosystem Priority Areas (NFEPA)

In designing the National Wetlands Inventory, the Department of Environmental Affairs and Tourism (DEAT) (now called the DEA), through the Wetlands Conservation Programme, embarked on a thorough process of consultation with stakeholders in the country, as well as with the United States National Wetlands Inventory (NWI), a unit of the United States Fish and Wildlife Services. The classification system forms a fundamental basis on which wetlands diversity and condition will be assessed and analysed.

The inventory dataset presents information on the extent, location and distribution of wetlands systems in South Africa. Upon completion of the project, a clear picture will exist of the extent, distribution and diversity of South Africa's wetlands, in the form of Geographic Information Systems (GIS) based digital coverage and printed maps. Wetland habitats were mapped and classified from remote sensing imagery. The methodology for mapping wetlands, as well as the kind of remote sensing to be used, was determined in the pilot study. Spatial information generated through the remote sensing mapping exercise will be stored in a GIS linked to a database containing supplementary wetland attribute information.

The national wetland coverage generated by the inventory seeks to establish a baseline for measuring future change in wetland area, function and values, and permit status, and if possible, trends analyses to be carried out in order to assess the need for, or effectiveness of, specific wetland conservation strategies. These analyses will be incorporated into various conservation and environmental management reports. The Wetland Classification System has been developed and applied to the National Wetlands Inventory.

NFEPA map products provide strategic spatial priorities for conserving South Africa's freshwater ecosystems and supporting sustainable use of water resources. These strategic spatial priorities are known as Freshwater Ecosystem Priority Areas, or FEPAs. FEPAs were determined through a process of systematic biodiversity planning and involved collaboration of over 100 freshwater researchers and practitioners. FEPAs were identified based on a range of criteria dealing with the maintenance of key ecological processes and the conservation of ecosystem types and species associated with rivers, wetlands and estuaries (Implementation Manual for Freshwater Ecosystem Priority Areas, 2011).

There were seventeen (17) wetland units identified in the area, with three (3) natural wetland units of NFEPA status. These wetlands have a natural land cover that is greater than, or equal to, 75%. There is one sub-quatarnary catchment of FEPA status and five (5) rivers, including the Wilgebos (unmodified, natural), Muishond (unmodified, natural), Kleinpoorts (unmodified, natural), Tankwa (moderately modified) and Ongeluks (moderately modified), located within the project area, none of which are flagship status (Figure 6-10). The impact of the proposed development on NFEPA's will be assessed during the EIA phase.

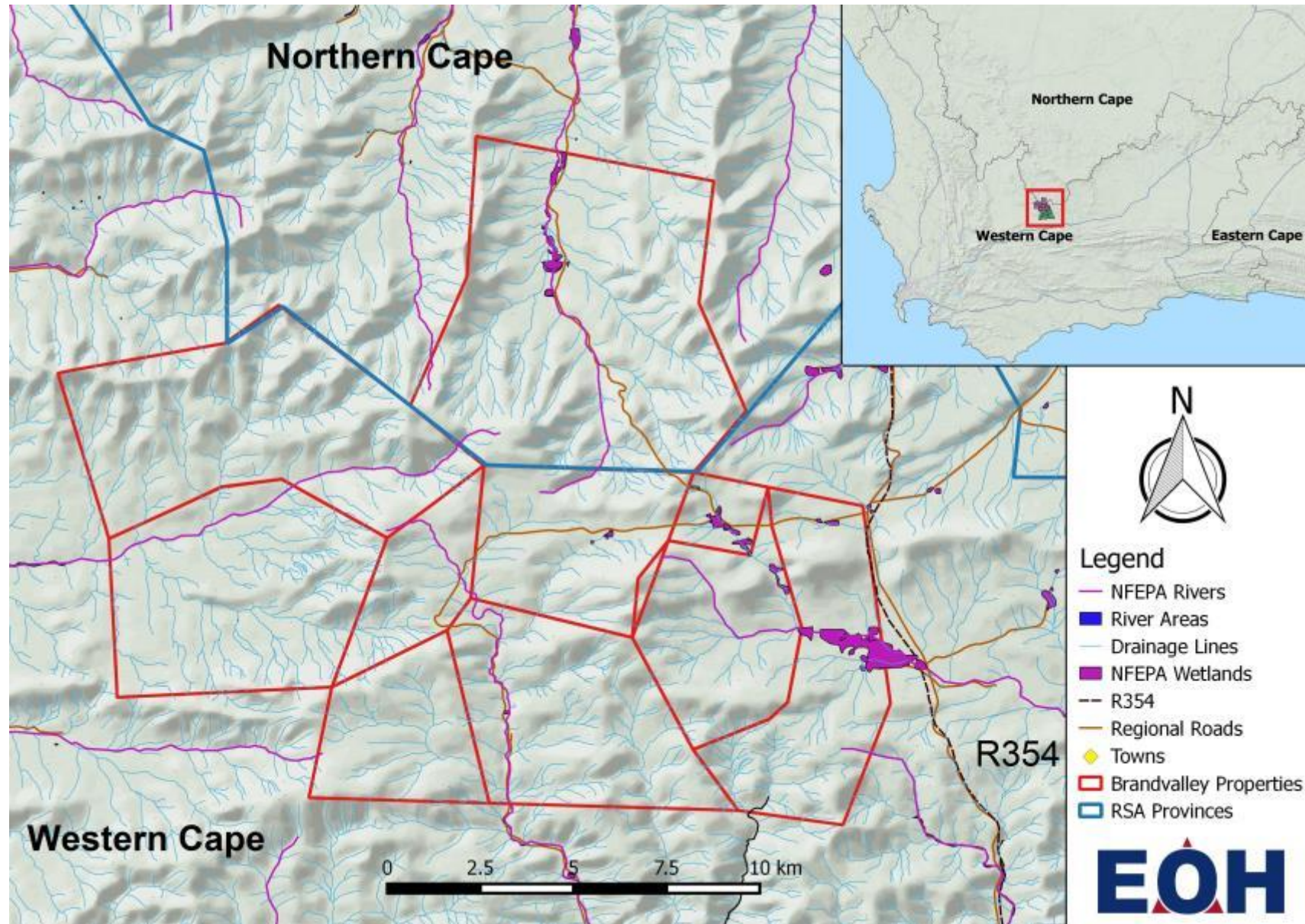


Figure 6-10: National Freshwater Ecosystem Priority Areas (NFEPA) within the proposed project area.

Critical Biodiversity Areas (CBAs)

The CBA maps were created with three main land-use planning and decision-making avenues:

1. Reactive decision-making, such as EIA agricultural land-use decisions, water-use licensing and other development control decisions through the Land Use Planning Act (No. 3 of 2014) (LUPA) or other land-use legislation;
2. Proactive forward planning, such as Integrated Development Plans (IDPs), Spatial Development Frameworks (SDFs) and Zoning Schemes; and
3. Proactive conservation, such as stewardship, land acquisition & easements.

The categories of the CBA map area as follows:

- CBAs (Terrestrial and Aquatic);
- ESAs (Critical and Other);
- Other Natural Remaining Areas; and
- No Natural Remaining Areas.

Critical Biodiversity Areas and Ecological Support Areas represent the biodiversity priority areas that should be maintained in a natural to near natural state. Other natural remaining areas and no natural remaining areas are not considered as priority areas and a loss of biodiversity within these areas may be acceptable.

The tools consulted in identifying the presence of CBAs in the project area include the Namakwa District CBAs, the 2010 Western Cape Biodiversity Framework: CBA and ESAs of the Western Cape; the Witzenberg Municipality CBAs; and the Central Karoo District Municipality Biodiversity Assessment (including Cape Winelands District Municipal Area).

As depicted by Figure 6-11, the project area falls within an ESA and CBAs in terms of the Cape District Municipality Biodiversity Assessment; a CBA of T2 status¹⁵ as per the Namakwa District Municipality CBAs and an ESA and CBA as identified by the Central Karoo District Municipality Biodiversity Assessment.

The CBAs found within the project area are generally important areas for ecological processes and are known to be of high biodiversity area. The CBAs within the Northern Cape are mainly areas with steep south-facing mountain slopes that are larger than 25ha in extent. The CBAs are near-natural landscapes with ecosystems and species that are largely undisturbed. These areas are to be managed and maintained in a near natural landscape. There are options for some loss of biodiversity components and ecosystem integrity and functioning in these areas, without compromising the ability to meet the biodiversity targets. These landscapes are approaching, but have not yet reached their limits of acceptable change.

The CBAs mapped will be assessed by the ecologist in order to determine the impacts of the proposed development on the CBAs and to recommend suitable mitigation measures.

¹⁵ Type 2 State (T2) refers to CBAs in a near-natural state where (1) ecosystems and species largely intact and undisturbed, (2) Areas with intermediate irreplaceability or some flexibility in terms of area required to meet biodiversity targets. There are options for loss of some components of biodiversity in these landscapes without compromising our ability to achieve targets and (3) these are landscapes that are approaching but have not passed their limits of acceptable change (BGIS, 2015).

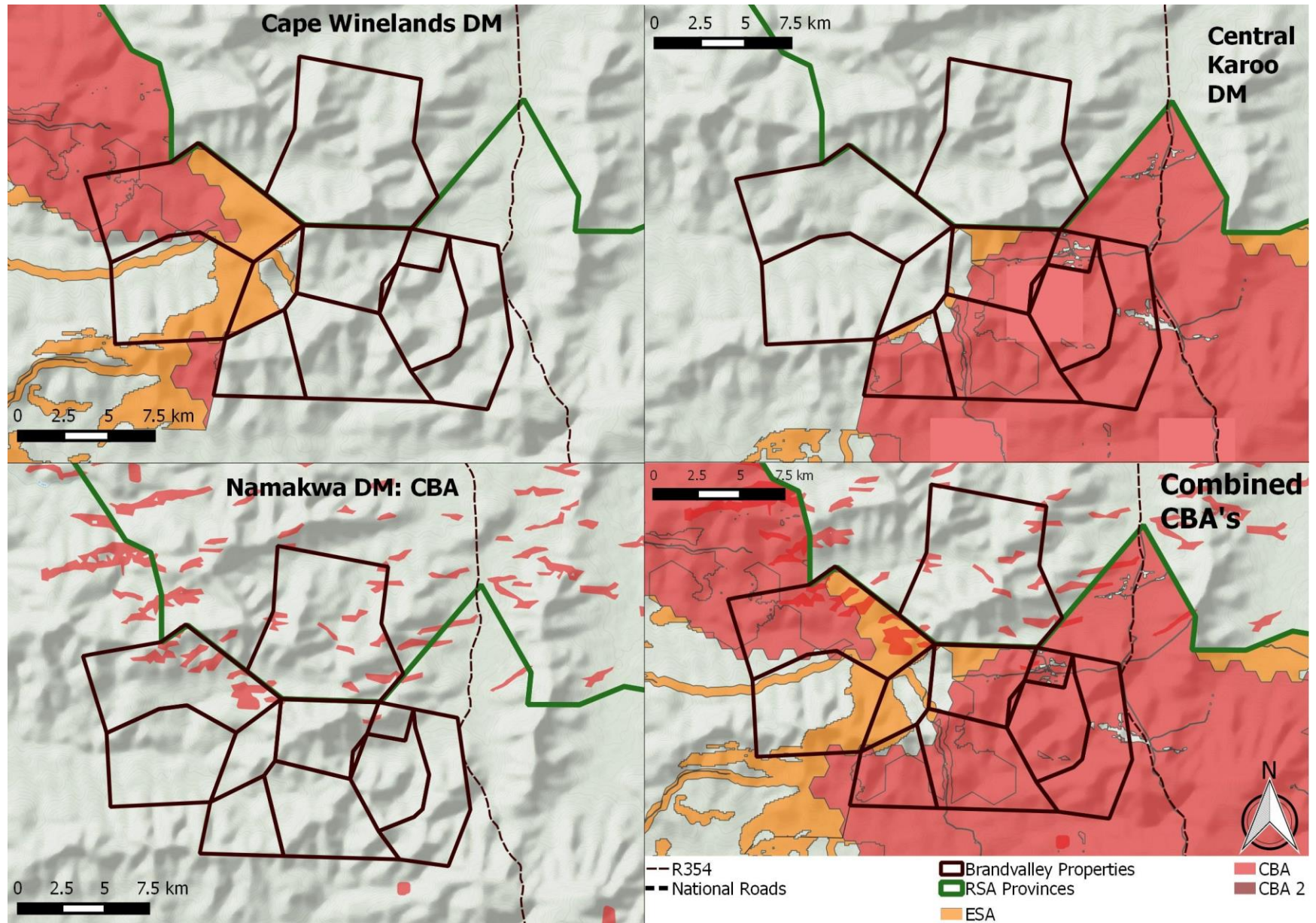


Figure 6-11: CBAs and ESAs within the proposed project area.

6.2 Summary of Potential Biophysical Sensitivities

As discussed above, various noteworthy features could potentially be found within the project development area including:

- NPAEAS focus area of the Western Karoo;
- Wetlands and rivers of NFEPA status; and
- CBAs and ESAs

These preliminary findings will be investigated and verified by specialists during the EIA phase as discussed in Section 9.4.

Figure 6-12 and Figure 6-13 indicate the identified sensitivities in relation to the conceptual layout for the proposed project.

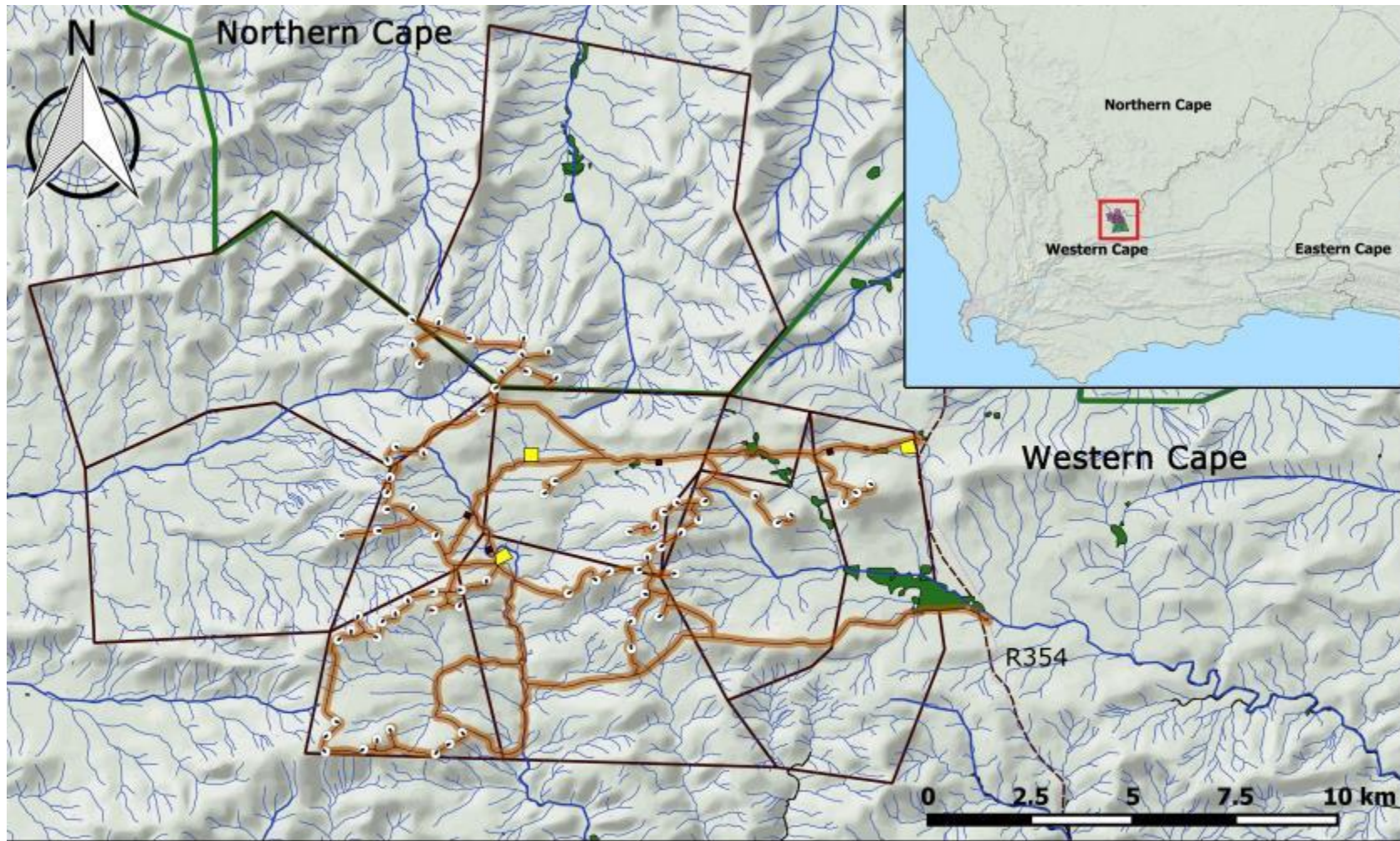


Figure 6-12: Identified sensitivities including important rivers, wetlands and drainage lines in relation to the proposed project site.

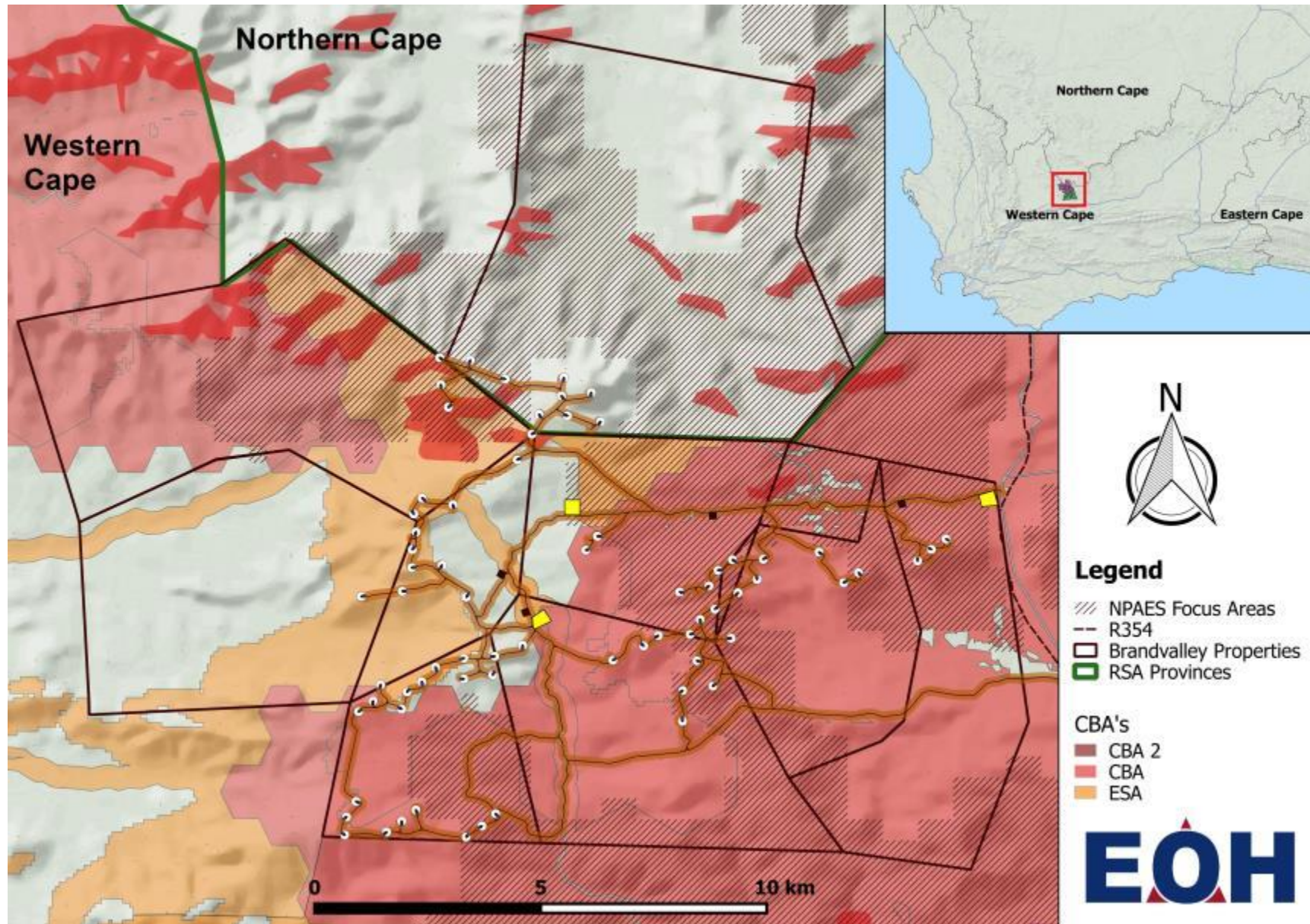


Figure 6-13: Identified sensitivities including NPAES, CBAs and ESAs in relation to proposed project site.

6.3 Socio-Economic Profile

The Brandvalley WEF is located on the border of the Northern and Western Cape Provinces and falls into the Namakwa District Municipality (Karoo Hoogland Local Municipality) in the Northern Cape and the Central Karoo District Municipality (Laingsburg Local Municipality) and Cape Winelands District Municipality (Witzenburg Local Municipality) in the Western Cape.

6.3.1 Karoo Hoogland Local Municipality

The Karoo Hoogland Local Municipality is found in the Namakwa District Municipality in the Northern Cape province. Three main towns occur in this local municipality, namely Fraserberg, Sutherland and Williston. The project occurs near the Sutherland area of this Municipality.

Population demographics indicate that the area is made up by 78.9% of the coloured population 14.6% white population and the remaining 6.5% being black African and Asian/Indian population. Afrikaans is the predominant language spoken in this municipality where 90.2% of the population are Afrikaans speakers.

Population Demographics

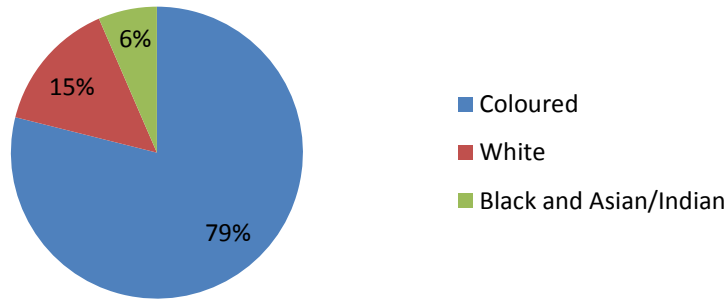


Figure 6-14: Illustrating the Population demographics of the Karoo Hoogland Local Municipality.

Households

2011 data indicates that the municipality had approximately 3,842 households, which on average had approximately 3 people per household. 96.6% of these households are formal dwellings, 47.3% are owned or being paid off and 30.6% are female-headed households (StatsSA, 2011).

Basic Services

Data for basic services available within this municipality show that 59.8% of households have access to piped water in their dwelling and between 46.4% and 64.9% use electricity for heating, cooking and lighting. Other sources of fuel or energy include wood where 22.6% of households use it for cooking while 38.4% use it as a source of heating. 39.4% dwellings have flush toilet connected to sewerage and 62.7% have weekly refuse removal. According to the Karoo Hoogland Municipality Revised IDP 2014-2015, there is only one registered landfill site and two that are permitted and are in the process of being registered. In contrast, the South African Waste Information Centre (SAWIC) shows that only two waste facilities have licences in this local municipality and both are facilities for the treatment of effluent, wastewater or sewerage.

Education and Employment

The education status of this municipality was determined by surveying those which were 20 years and older. Results indicated that 5,7 % had no form of schooling, 48.1% and had some primary school level education, 7.7% completed primary education, 24.2% have some secondary

education, 6.2% have completed matric and 0.6% have some form of higher education. The Northern Cape (in which this municipality is found) has an annual growth of 2.1% contributing 2.0% to the National GDP, which was 2.2% in 2013.

Of those sampled (of ages between 15 and 64) during the 2011 census, 3,655 were employed, 623 were unemployed and 395 were classified as discouraged work seekers and 3 170 are economically inactive. Unemployment rate in this district is at 14.6% and unemployment rate for the youth (between the ages 15-34) is at 20%. The Northern Cape unemployment rate was at 31.3% and the South African unemployment rate was 25% during the same survey, as shown in figure 6-15 below.

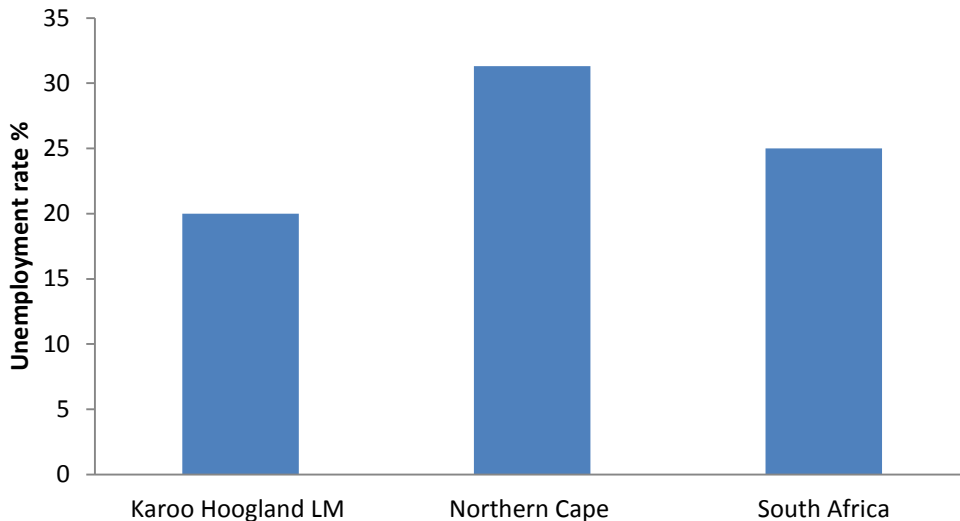


Figure 6-15: Illustrating the unemployment rate of the Karoo Hoogland Local Municipality in relation to the Northern Cape and National rate.

Health Access

Three clinics and two mobile clinics are found to occur in the Karoo Hoogland Local Municipality. The health services in this local municipality are inadequate due to the lack of doctors, ambulances and poor road infrastructures in some of the areas. Data for this municipality indicate that it has a high risk of drought and a high vulnerability to poverty and poor health services, roads and telecommunication all these are contributing factors that may affect the health status of the community.

6.3.2 Laingsburg Local Municipality

The Laingsburg LM consists of three types of communities namely the

- Laingsburg town with a population of 5,973 constituting the majority (67%) of the municipality.
- Matjiesfontein, a small community that has about 422 people (6%) of the total population in this municipality.
- The remaining population of 2,304 people (27%) resided on farms in various areas of the local municipality (IDP, 2013).

This Municipality has a growth rate of 2.16 %. As seen on the Pie chart below (Figure 6-16) population demographics indicate that the area is made up by 79% of the coloured population followed by 13.3% of the white population, 7% black African population and 0.7% of other population groups (STATS SA, 2011).

Population Demographics

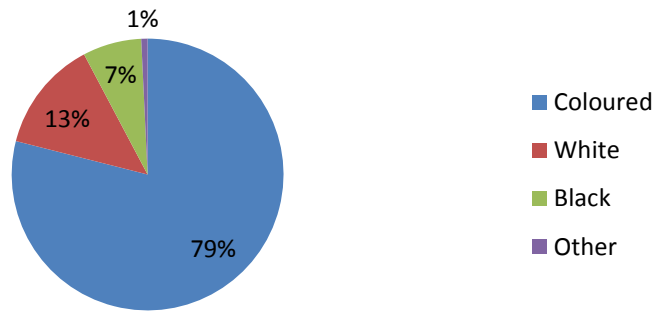


Figure 6-16: Illustrating the Population demographics of the Laingsburg Local Municipality.

Households

2011 data indicates that the municipality consisted of about 2,408 households, which on average had about 3.3 persons per household. 96% of these households are formal dwellings, 36.2% are owned or are being paid off and less than one third (31%) are female headed households.

Basic Services

Data for basic services in this municipality show that 92.7% of these households have access to piped water either in their dwelling or in their yard, whilst 0.6% did not have access to piped water at all. Electricity in this region is said to be lacking where 79.4% of households have access to electricity, other sources of energy such as solar energy are used in this district. 68.1% of the dwellings have flush toilet infrastructure connected to sewerage and 59.5% have weekly refuse removal. According to the South African Waste Information Centre (SAWIC), three waste facilities are found in this municipality. Two sites are for the disposal of general waste and a single waste water treatment facility.

Education and Employment

During the 2011 census, the education status of the area was determined by surveying those which were 20 years and older. Results indicated that 10,2% had no form of schooling, 7.7% only had primary school level education, 34.3% have some secondary education, 21.5 % have completed matric, 7% have some form of higher education (See Figure 6-17).

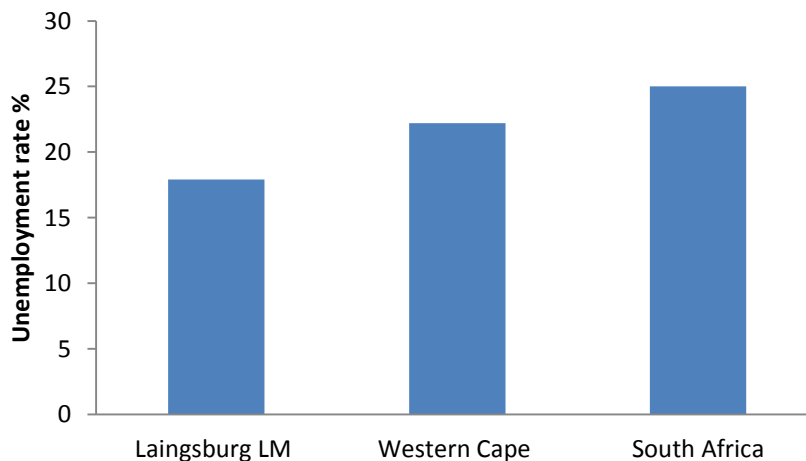


Figure 6-17: Illustrating the unemployment rate of the Laingsburg Local Municipality in relation to the Western Cape and National rate.

Unemployment rate in this district improved as it decreased from 26.3% (2001 census) to 17.9%, (Census, 2011) (StatsSA, 2011). The improvement in the employment rate may have been due to contract basis work, thus the results may not be reflecting the true current status of the municipality (IDP, 2013). This rate is slightly lower than the provincial unemployment of rate (22.2%) measured in January to March 2011; the South African unemployment rate was 25% during the same survey. Employment opportunities in this municipality is largely from the Agricultural Sector.

Health Access

A number of health facilities are found to occur in the Laingsburg Local Municipality, including the Laingsburg Hospital, Laingsburg clinic, Matjiesfontein Satellite Clinic and the Laingsburg Mobile Clinic. Other facilities in Laingsburg include Emergency Medical Services Ambulance Stations and Forensic Pathology Laboratories (Mortuaries). Thus there is only one health facility (Matjiesfontein Satellite Clinic) in the Matjiesfontein area. This municipality is said to be one the most deprived in the Province. (APP, 2014).

6.3.3 Witzenberg Local Municipality

Witzenberg Local Municipality is located within the Cape Winelands District Municipality in the Western Cape Province. Five towns occur in this municipality namely; Ceres, Tulbagh, Prince Alfred’s Hamlet, Wolseley and Op-die-Berg and rural areas are Warm Bokkeveld, Koue Bokkeveld, Agter-Witzenberg and the northern portion of Breede River Valley (Het Land van Waveren). The project area occurs on the Tweedside farm, which is found within this Municipality.

Population Demographics

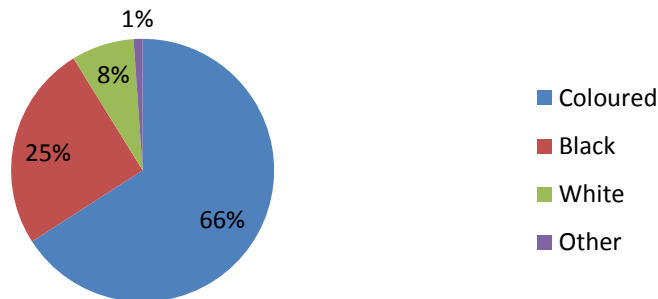


Figure 6-18: Illustrating the Population demographics of the Witzenberg Local Municipality.

Population demographics indicate that the area is made up by 65.9% of whom are coloured, 25.3% are black African, 7.7% are white and 1.1% are from other population groups. Afrikaans is the predominant language spoken in this municipality where 73.8% of the population are Afrikaans speakers.

Households

2011 data indicates that the municipality has about 27,419 households, which on average had about 3.8 persons per household. 86.2% of these households are formal dwellings, 34.5 % are owned or are being paid off and 28.9% are female-headed households.

Basic Services

Data for basic services in this municipality shows that 90.9% of households have access to piped water in their dwelling and 0.5% households have no access to piped water. Electricity is the main source of energy for cooking (89.2%), heating (59.7%) and lighting (93.4%) while 26.2% use wood for heating. 86.9% households have flush toilet systems connected to sewerage system and 69.9% have weekly refuse removal. According to the South African Waste Information Centre (SAWIC),

five waste facilities are found in this municipality. Two of these are facilities are waste-water treatment facilities namely the; At Source WWTW and At Source Handmade Food. The remaining three facilities are namely the; Prince Alfred Hamlet Composting Facility which is used as a temporary storage site for general waste, the Rhodes Food Group Storage Facility which is used as a storage site for hazardous waste and the Tulbach Garden which is a temporary storage site and site for the disposal of general waste. These facilities maybe suitable for the disposal of the waste that will be generated during the construction of the wind turbines.

Education and Employment

The education status of this municipality was determined by surveying those which were 20 years and older. Results indicated that 3,1% had no form of schooling, 40.8% and had some primary school level education, 7.3% completed primary education, 35.1% have some secondary education, 10.4% have completed matric and 1.0% have some form of higher education.

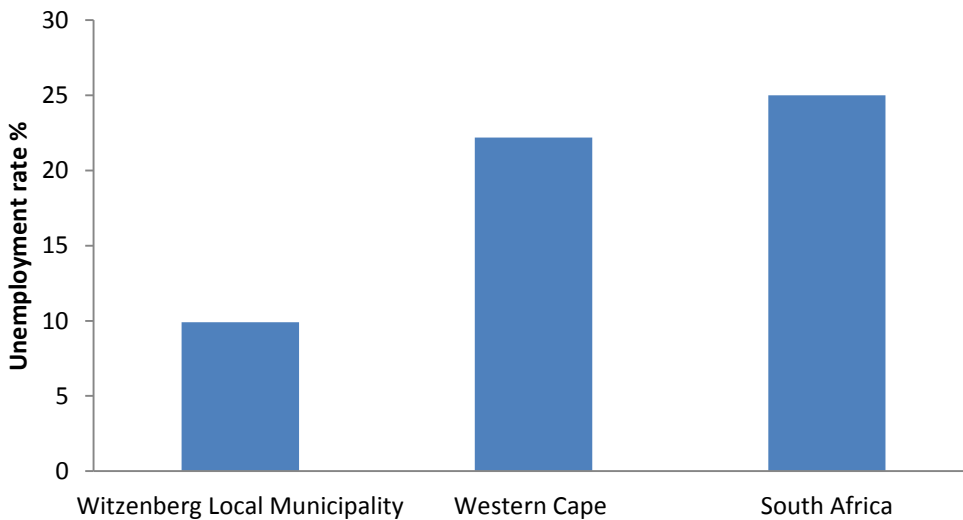


Figure 6-19: Illustrating the unemployment rate of the Witzenberg Local Municipality in relation to the Western Cape and National rate.

Of those sampled (between 15-64), 52,062 are employed, 4,272 are unemployed and 1,067 are classified as discouraged work seekers while 24,231 are economically inactive. The unemployment rate in this district was recorded as 7.6% and unemployment rate for the youth (between the ages 15-34) is 9.9%. This rate is lower than the provincial unemployment of rate (22.2%) measured in January to March 2011; the South African unemployment rate was 25% during the same survey.

Health Access

The Cape Winelands District Municipality has 7 hospitals. 16 health facilities are found to occur in this Municipality, a single Community Day Center, 8 clinics and 7 mobile clinics (APP, 2014).

6.3.4 Heritage and cultural resources

A Heritage Screener was conducted to identify any heritage, archaeological and paleontological resources found within the wider project area based on previous specialist assessments undertaken. The Heritage Screener is provided in Appendix F of the Report, and a short summary of the key findings reported below. The middle section (referred to as Area A) of the project development has been subjected to previous specialist assessments whereas the eastern and western portions (referred to as Area B) have not been assessed in detail.

The recommendations made in the heritage screener took into consideration the level of assessments previously undertaken and therefore made two sets of recommendations.

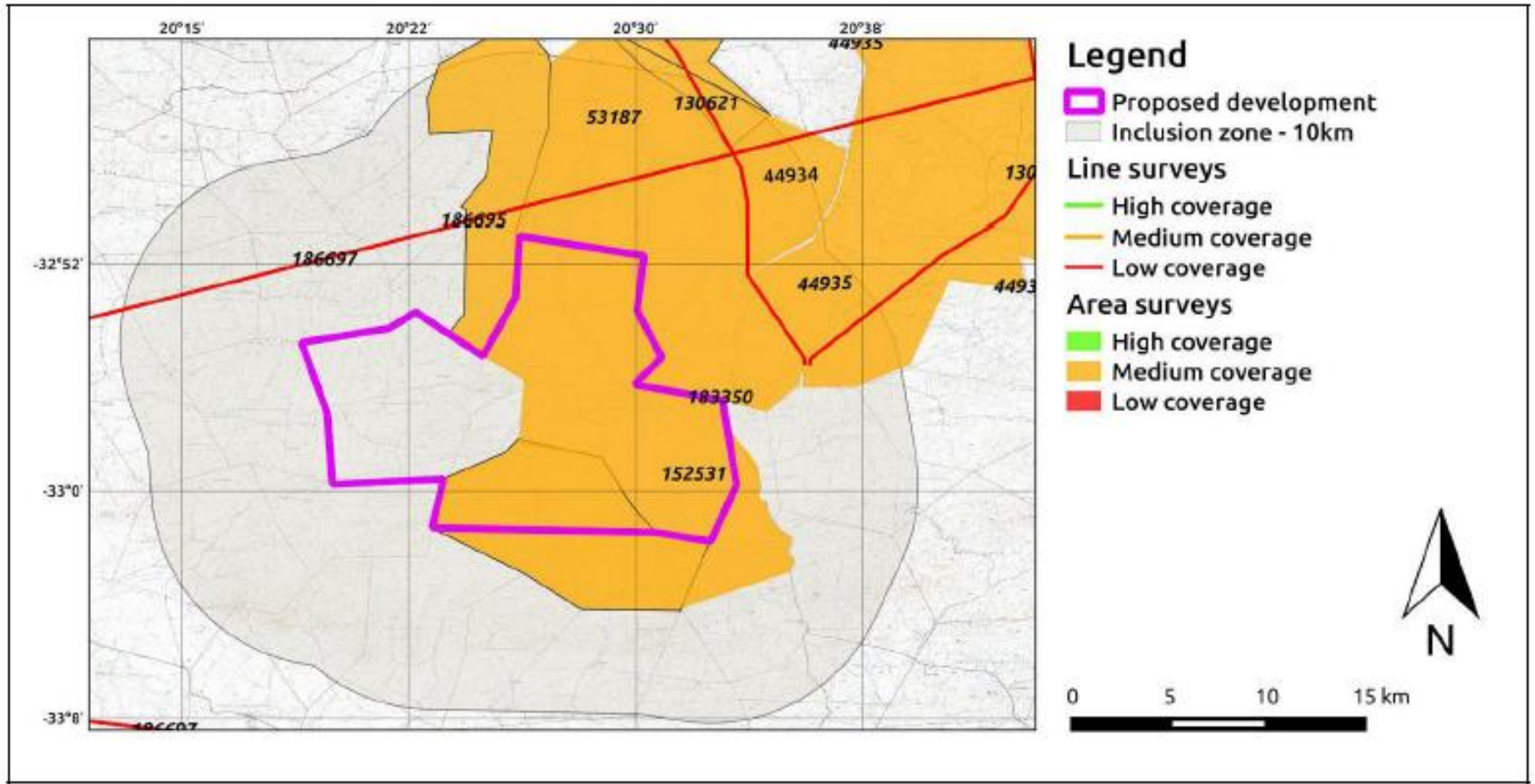


Figure 6-20: Previous Heritage Impact Assessment done in and near the proposed development area with SAHRIS NID labels indicated (PIAs excluded).

Heritage and Archaeological Resources

Previous assessments reported no Stone Age heritage within Area A of the proposed project area. Noteworthy heritage resources found in Area A include burial grounds and graves as well as structures older than 100 years, such as stone walling related to pastoralism and Anglo Boer War fortifications. Most of the sites, other than the burial grounds, are considered to have low archaeological significance.

The burial sites are, however, of heritage significance and it is recommended that a buffer of at least 30m is placed around the burial grounds identified. It is additionally recommended that an archaeologist familiar with the historical and Stone Age archaeology of the Northern Cape conduct a walk-through of the final turbine positions and ancillary infrastructure located within Area A. It was furthermore recommended that an Archaeological Impact Assessment be undertaken for Area B to assess the proposed development.

Paleontological Resources

The proposed project area is underlain by formation of low to very high fossil sensitivity, including the Abrahamskraal Formation of the Beaufort Group and the Whitehill, Waterford, Fort Brown and Tierberg Formations of the Ecca Group.

It is recommended that a palaeontologist conducts monitoring during the construction period in areas identified with high sensitive formations.

Several Paleontological Impact Assessments were undertaken for similar projects where very few fossils were reported. It was recommended with support from SAHRA, that monitoring be undertaken during excavations for footings of turbines, trenches, borrow pits and deep rock excavations since paleontological material may be affected during the construction phase. Therefore, a Paleontological Impact Assessment was not recommended for this assessment but it is recommended that monitoring by a palaeontologist be undertaken during construction (Ceder Tower, 2016).

A Notice of Intention to Develop was submitted to the Heritage Western Cape and SAHRA to confirm the recommendations from the heritage screener. Therefore, a Paleontological Impact Assessment is not required for this assessment but it is recommended that monitoring by a palaeontologist be undertaken during construction.

Aesthetic Value

It has been recommended that a Visual Impact Assessment is conducted with particular consideration of the impact on the R354 to inform the layout of Brandvalley WEF.

6.3.5 Current and Proposed Land Uses and Other Developments in the Area

The project area consists of natural habitat, which has experienced some grazing, but is predominately untouched. The proposed project area is currently used for animal husbandry, game farming and agriculture. The predominant land use in the project area is for the farming and grazing of sheep, most suited to Western Cape region of the project area. There are a few Bed and Breakfast accommodation services (B&Bs) within the project area to accommodate those visiting the area and its surroundings.

There are various proposed and existing developments situated in the Great Karoo, impacting the financial, economic, ecological and social environments. Such developments include the South African Large Telescope (SALT), the Square Kilometre Array (SKA), proposed shale gas mining, existing and proposed electrical facilities such as WEFs, solar energy facilities and other grid infrastructure and various commercial and subsistence farming operations.

The South African Large Telescope (SALT) is located approximately 50km north-west of the site. The renowned heritage resources and historical value associated with the Karoo are a few of the features contributing to tourism in the area, which promotes the use of the B&Bs.

The project area additionally overlaps with the area in which Technical Cooperation Permits (TCPs) are held by certain Oil and Gas companies. The project area (~225km²) is, however, relatively insignificant in comparison to the overall size of the TCP (~30 000km²).

These proposed developments are described below.

All of the existing land uses can continue should the WEF be authorised.

The Southern African Large Telescope (SALT)

The Southern African Large Telescope (SALT) is the largest single optical telescope in the southern hemisphere, located approximately 50km north-east of the proposed project area, near Sutherland. SALT is an international initiative, driven by a consortium of partners from Germany, Poland, the United States, the United Kingdom, New Zealand and South Africa. The development is located at the South African Astronomical Observatory (SAAO) field station, near Sutherland in the Northern Cape Province. The telescope, which has been operational since September 2011, comprises of a mirror array that spans across 11 meters in a hexagonal shape with 91 mirrors, each 1 m in length (Plate 6-5). SALT holds national importance in driving innovations in astronomy, science and technology in South Africa as well as forming international relations, boosting tourism and contributing to local education and improving technological skills.

The SALT development is sensitive to dust, light and other interferences that may visually obstruct viewing. Mitigation measures to reduce potential light and dust pollution during the construction and operational stages of the project will be included in the EMP. SALT and the SAAO have been identified as I&APs for the proposed project and will be consulted accordingly and invited to comment on the proposed development. Discussions will be advanced (outside of the EIA process) with the SAAO/SALT, Civil Aviation Authority (CAA) in order to ensure that proposed mitigations accommodate the lighting requirements in accordance with the Civil Aviation Act 13 of 2009.



Plate 6-5: The Southern African Large Telescope (SALT) located near Sutherland.¹⁶

¹⁶ Source: SALT (2015)

The Square Kilometre Array (SKA)

The Square Kilometre Array (SKA), an astronomy facility, is an international initiative driven by engineering, science, technology and research and development incentives to build the world’s largest radio telescope within a one square kilometre. The facility is located in the Upper Karoo area. The nearest SKA station has been identified as SKA Station SKA-2379, approximately 75km from the proposed Brandvalley WEF project area. approximately 350km north of the proposed Brandvalley WEF project area. The SKA will comprise of collection or array of radio telescopes constructed in a unique configuration, allowing astronomers exceptionally detailed observation of the sky that is thousands of times faster than current technology.

The SKA Organisation was established as a not-for-profit enterprise, inclusive of eleven (11) countries, namely Australia, Canada, China, Germany, India, Italy, New Zealand, South African, Sweden, the Netherlands and the United Kingdom. The project is located in the Great Karoo in South Africa and is currently in the construction phase. The Karoo Array Telescope (MeerKAT), a phase of SKA, is the world’s first radio telescope array consisting of antenna structures. This phase is located near Carnarvon in the Karoo and is currently being commissioned. The MeerKAT comprises of seven (7) dishes arranged in a unique array (Plate 6-5). The first seven dishes are known as the KAT-7 and were completed in December of 2010. The SKA Phases 1 and 2 are in the pre-construction phase of the project but are predicted to be under construction from 2017 to 2024. The SKA is of importance to science, technology, astronomy and the economy of South Africa.

600 grants have been received through the SKA development for astronomy courses that are being offered in Kenya, Mozambique, Madagascar and Mauritius in order to drive skills and training for SKA as well as other engineering, science, astronomy and technology projects in Africa. The SKA further contributes to job creation, local skills development and tourism.



Plate 6-6: The MeerKAT of the Square Kilometre Array (SKA) development located near Carnarvon, Northern Cape.¹⁷

¹⁷ Source: SKA (2015)

The MeerKAT and SKA development is sensitive to dust as well as man-made electronics and machines that emit radio waves that will interfere with the radio signals. The site is located at a specific height and in a dry area to ensure radio waves are not absorbed by the moisture in the surrounding environment.

It is not anticipated that the proposed development will have a negative impact on the MeerKAT or SKA development due to it being 350km from the proposed development and will therefore not be assessed in the EIA Phase. SKA were nonetheless notified of the proposed development as a potential Interested and Affected Party.

Proposed Shale Gas Exploration

The Karoo Basin, covering 400,000m², has been identified as an area with potential for shale gas extraction. Various entities propose to undertake shale gas mining (SGM) of the area to extract shale gas. SGM involves high-volume, horizontal, slick-water fracturing (i.e. fracking or hydraulic fracturing). Fracking is a process that involves pumping pressurised water, sand and chemicals into horizontal drilling wells. The hydraulic pressure causes the underground shale layers to fracture and the gas resources to be released.

There has been much investigation into the positive and negative impacts of fracking. Positive impacts may include economic benefits, such as employment generation and increased power generation. Adverse impacts could include environmental degradation, loss of vegetation, potential groundwater contamination, habitat loss and fragmentation, lack of adequate infrastructure and skills, inadequate policy and legislation and inability to ensure compliance to existing legislation, significant construction and operational costs and public health risks concerns.

There has been on-going debate in South Africa regarding the proposed fracking of shale gas in Great Karoo. Currently, the volume of gas, and thus the feasibility of SGM, in the Karoo is uncertain. The economic value will only be uncovered once seismic studies and hydraulically fracking takes place (Petroleum Agency SA, 2013).

Oil and Gas companies have been granted Technical Cooperation Permits (TCPs) in terms of 77(1) of the Mineral and Petroleum Resources Development Act (No. 28 of 2002), allowing these applicants to undertake desktop studies in the Karoo area. These companies include Shell International (185,000km²), Sasol/Chesapeake/Statoil Joint Venture (JV) (88,000km²), Angola Coal (50,000km²), Falcon Oil and Gas (30,000km²) and Sunset Energy (initially applied for by Bundu) (4,610km²). Figure 6-21 provides a representative map of the approximate areas for which TCPs are issued to these Oil and Gas companies.

In order for these entities to explore shale gas potential, an exploration right in terms of the MPRDA has to be obtained. Currently, three entities, namely Bundu, Falcon Oil and Gas and Shell (Treasure the Karoo Action Group, 2015), have applied for exploration right but no decisions have been taken on these applications to date.

Relevant companies whose TCP areas overlap with the proposed WEF development will be included in the I&AP database, and will be invited to submit comments during the PPP.

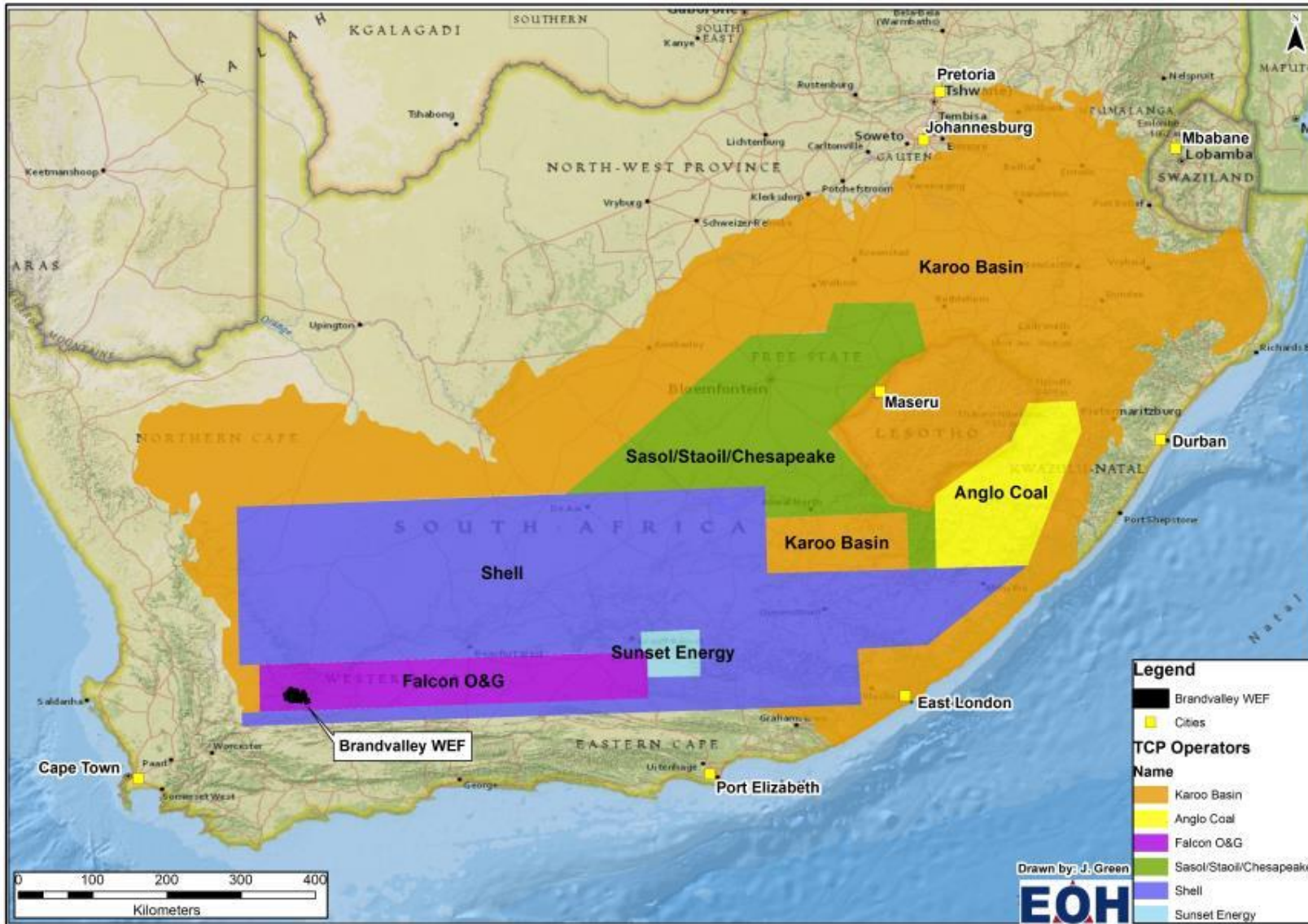


Figure 6-21: Technical Cooperation Permits (TCP) areas granted to Oil and Gas companies in the Karoo Basin (approximate areas)¹⁸.

¹⁸ The TCP area granted to Sunset Energy was initially applied for by Bundu.

7. IDENTIFICATION AND ASSESSMENT OF POTENTIAL IMPACTS

According to Appendix 2(2) of the EIA Regulations (GN R.982 of 2014), a *Scoping Report* must contain all the information necessary for a proper understanding of the process, informing all preferred alternatives, including location alternatives, the scope of the assessment, and the consultation process to be undertaken through the environmental impact assessment process, and must include –

(h)

(v) the impacts and risks identified for each alternative, including the nature, significance, consequence, extent, duration and probability of the impacts, including the degree to which these impacts –

(aa) can be reversed;

(bb) may cause irreplaceable loss of resources; and

(cc) can be avoided, managed or mitigated;

(vi) the methodology used in determining and ranking the nature, significance, consequences, extent, duration and probability of potential environmental impacts and risk associated with alternatives;

(vii) positive and negative impacts that the proposed activity and alternatives will have on the environment and on the community that may be affected focusing on the geographical, physical, biological, social, economic, heritage and cultural aspects;

(viii) the possible mitigation measures that could be applied and level of residual risk.

7.1 Introduction

The proposed WEF can result in various impacts on the biophysical environmental and socio-economic environment. In order to rate the potential impacts associated with the various alternatives identified in Chapter 3 of this Report, EOH CES (the EAP) has developed a revised rating scale for the Scoping Phase of the EIA process in accordance with the requirement outlined in Appendix 2 of the amended NEMA EIA Regulations (2014). This risk scale takes into consideration the following variables:

- Nature
- Significance
- Consequence
- Extent
- Duration
- Probability
- Reversibility, potential for irreplaceable loss of resources and mitigation.

It is however important to note that the impacts are assessed and rated on a broader issues level, and are regarded as preliminary. Environmental impacts that are of concern are rated to potentially have a higher significance which will be assessed further in a more rigorous detail during the EIA phase.

7.1.1 Impacts Identification matrix

Five factors are considered when assessing the significance of the identified issues, namely:

1. **Consequence** - the consequence scale is used to objectively evaluate how severe the impacts might be on the receiving environment.
2. **Extent** - the spatial scale defines the physical extent of the impact.
3. **Duration** - the temporal scale defines the significance of the impact at various time scales, as an indication of the duration of the impact.

4. The **probability** of the impact occurring - the likelihood of impacts taking place as a result of project actions arising from the various alternatives. There is no doubt that some impacts would occur (e.g. loss of vegetation), but other impacts are not as likely to occur (e.g. vehicle accident), and may or may not result from the proposed development and alternatives. Although some impacts may have a severe effect, the likelihood of them occurring may affect their overall significance.

5. **Reversibility / Mitigation** – The degree of difficulty of reversing and/or mitigating the various impacts ranges from very difficult to easily achievable. The four categories used are listed and explained in Table 7-1 below. Both the practical feasibility of the measure, the potential cost and the potential effectiveness is taken into consideration when determining the appropriate degree of difficulty.

Significance is then determined by ranking of the above criteria by assigning scores, as presented in Table 7-1. These scores are then added together to determine the overall significance of an activity. The total scores recorded for the effect (which includes scores for duration; extent; consequence and probability) and reversibility / mitigation are then read off the matrix presented in Table 7-2, to determine the overall significance of the issue. The overall significance is either negative or positive which is considered to be the **nature** of the impact.

Table 7-1: Ranking of Evaluation Criteria.

Effect	Duration		Score
	Short term	Less than 5 years	
Medium term	Between 5-20 years	2	
Long term	More than 20 years	3	
Extent			Score
Localised	The proposed site and its immediate environments	1	
Moderate	District / Municipal and Provincial level	2	
Extensive	National and International level	3	
Consequence			Score
Slight	Slight impacts or benefits on the affected system(s) or party(ies)	1	
Moderate	Moderate impacts or benefits on the affected system(s) or party(ies)	2	
Severe/ Beneficial	Severe impacts or benefits on the affected system(s) or party(ies)	3	
Probability			Score
Unlikely	The likelihood of these impacts occurring is slight (low probability)	1	
May Occur	The likelihood of these impacts occurring is possible (high probability)	2	
Definite	The likelihood is that this impact will definitely occur	3	
Reversibility / Mitigation	Likelihood		Score
	Easily achievable	The impact can be easily, effectively and cost effectively mitigated/reversed	
	Achievable	The impact can be effectively mitigated/reversed without much difficulty or cost	2
	Difficult	The impact could be mitigated/reversed but there will be some difficulty in ensuring effectiveness and/or implementation, and significant costs	3
	Very Difficult	The impact could be mitigated/reversed but it would be very difficult to ensure effectiveness, technically very challenging and financially very costly	4

Table 7-2: Matrix used to determine the overall significance of the impact based on the likelihood and effect of the impact¹⁹.

Reversibility / Mitigation		Effect								
		4	5	6	7	8	9	10	11	12
	1	5	6	7	8	9	10	11	12	13
	2	6	7	8	9	10	11	12	13	14
	3	7	8	9	10	11	12	13	14	15
	4	8	9	10	11	12	13	14	15	16

Table 7-3: Description of Issues Level Significance Ratings and associated range of scores.

Significance Rate	Description	Score
Low	The impacts on this issue are acceptable and mitigation, whilst desirable, is not essential. The impact on the issue by themselves are insufficient, even in combination with other low impacts, to prevent the development being approved. Impacts on this particular issue will result in either positive or negative medium to short term effects on the social and/or natural environment.	5-8
Moderate	The impacts on this issue are important and require mitigation. The impacts on this issue are, by themselves, insufficient to prevent the implementation of the project, but could in conjunction with other issues with moderate impacts, prevent its implementation. Impacts on this particular issue will usually result in either a positive or negative medium to long-term effect on the social and/or natural environment.	9-12
High	The impacts on this issue are serious, and if not mitigated, they may prevent the implementation of the project (if it is a negative impact). Impacts on this particular issue would be considered by society as constituting a major and usually a long-term change to the (natural and/or social) environment, and will result in severe effects or if positive, substantial beneficial effects.	13-16

The **issues level environmental significance** scale needs to take the context into account, and at the relevant level. For example, if the issue under consideration is “changes to the terrestrial biological environment”, the impacts to be considered when assessing this issue might include (1) loss of a particular vegetation type, (2) disruption to, or loss of, faunal habitats, (3) fragmentation of habitats (4) loss of species of conservation concern. The evaluation of the significance of the issue therefore relies heavily on the information that is available at the Scoping stage of an EIA, and out of necessity must be broad and value laden. For this reason, impacts need to reflect the values of the affected society.

Prioritising for further assessment

The evaluation of the issues, as described above, is used to prioritise which issues require mitigation measures, or which issues might lead to a conclusion that the particular alternative under assessment is not appropriate.

Negative issues that are ranked as being of “**HIGH**” significance will need to be investigated further to determine how the impacts can be minimised, or what alternative activities or mitigation measures can be implemented.

For issues identified as having a negative impact of “**MODERATE**” significance, it would be standard practice to investigate alternate activities and/or mitigation measures. The most effective and practical mitigation measures will then be proposed.

¹⁹For positive impacts, a higher score (a score in the red zone) is preferred to a lower score (a score in the green zone). For negative impacts, a higher score (a score in the red zone) is less desirable than a lower score (a score in the green zone).

For impacts ranked as “**LOW**” significance, no investigations or additional alternatives will be considered. Possible management measures will be investigated to ensure that the impacts remain of low significance.

7.1.2 Cumulative Impacts

Cumulative impacts result from incremental changes caused by other past, present or reasonably foreseeable actions acting in concert with the project. Individually minor impacts from different developments can interact in various ways over time to become collectively significant. Barbour (2007: 39), adapting work by Cooper, 2004, describes cumulative impacts as impacts which “may be:

- **Additive:** the simple sum of all the effects (e.g. the accumulation of ground water pollution from various developments over time leading to a decrease in the economic potential of the resource);
- **Synergistic:** effects interact to produce a total effect greater than the sum of individual effects. These effects often happen as habitats or resources approach capacity (e.g. the accumulation of water, air and land degradation over time leading to a decrease in the economic potential of an area);
- **Time crowding:** frequent, repetitive impacts on a particular resource at the same time (e.g. multiple boreholes decreasing the value of water resources);
- **Neutralizing:** where effects may counteract each other to reduce the overall effect (e.g. infilling of a wetland for road construction, and creation of new wetlands for water treatment); and,
- **Space crowding:** high spatial density of impacts on an ecosystem (e.g. rapid informal residential settlement).”

Cumulative impacts are, however, difficult to accurately and confidently assess, owing to the high degree of uncertainty, as well as it often being based on assumptions. It is therefore difficult to provide as detailed an assessment of cumulative impacts as is the case for direct and indirect project induced impacts. This is usually because of the absence of specific details and information related to cumulative impacts. In these situations, the EAP will need to ensure that any assumptions made as part of the assessment are made clear. Accordingly, the EIA will include an overview and analysis of cumulative impacts related to a variety of project actions, and does not provide a significance rating for these impacts, as was done for direct project induced impacts. The objective is to identify and focus on potentially significant cumulative impacts so these may be taken into consideration in the decision-making process. It is important to realise these constraints, and to recognise that the assessment will not, and indeed cannot, be perfect. The potential for cumulative impacts will, however, be considered, rather than omitted from the decision making-process and is therefore of value to the project and the environment.

The following assumptions will guide the cumulative assessments:

- All projects within a 30km radius were considered.
- It is assumed that all projects proposed (both energy generation and electrical infrastructure projects) will be implemented as a worst case scenario.
- The proposed projects considered are provided in Figure 9.1.

7.2 Identification and Assessment of Impacts

The table below lists these issues identified at the Scoping level, and its alternatives and presents the results of the assessment using the approach described above. It also presents possible mitigation measures at a high level, and the residual risk associated with the issue for each alternative.

Based on the nature of the project, the project location and experience with similar developments, the following impacts were identified:

- Impacts on topography and geology
- Change in land use from agricultural to power generation
- Geotechnical impacts
- Removal of top soil resulting in soil erosion
- Impacts on surface and groundwater resources
- Disruption to terrestrial ecosystems
- Disruption to aquatic ecosystems
- Impacts on fauna (including birds and bats) and flora
- Health and safety
- Impacts on archaeological, paleontological and/or cultural sites
- Social disruptions
- Social benefits from the project including employment opportunities, social investment, training and skills development opportunities
- Traffic impacts
- Noise impacts
- Air quality impacts in the form of additional dust
- Alignment with planning instruments
- Impact on energy production

IMPACT	RELEVANT PROJECT COMPONENT	CAUSE AND COMMENT	SIGNIFICANCE OF IMPACT	CONSEQUENCE OF IMPACT	EXTENT OF IMPACT	DURATION OF IMPACT	PROBABILITY OF IMPACT	DEGREE OF REVERSIBILITY AND/OR MITIGATION	MITIGATION MEASURES	RESIDUAL RISK ²⁰
IMPACTS ON THE BIOPHYSICAL ENVIRONMENT										
<i>Impacts on topography and geology</i>	<u>Construction phase of all project components (i.e. all alternatives)</u>	It is envisaged that only minor changes to topography will be required during the construction phase of the development, and only at localised areas, such as at the turbine positions.	LOW (-)	Slight	Localised	Short Term	May Occur	N/A	None required	LOW (-)
<i>Impacts on land use</i>	<u>Lifecycle of the project (all alternatives)</u>	The current land use for the area under consideration is sheep and/ or game farming. Farming and renewable energy generation can co-exist and therefore the impact on land use will be low as the current land-use and the operation of a wind energy facility can take place simultaneously, on the same land portions.	LOW (-)	Slight	Localised	Long Term	Definite	Achievable	Farming practices should be allowed to continue. There should be coordination with the farmers of the affected properties in order to minimise disruptions during the construction and operational phases. An Agricultural Assessment will be undertaken in the EIA phase of the project. This will include further mitigation measures with site specific recommendations.	LOW (-)
<i>Geotechnical impacts and removal of top soil and soil erosion</i>	<u>Construction phase of all project components (i.e. all alternatives)</u>	<u>The construction of the proposed project and the associated infrastructure will require the clearing of vegetation which will result in exposed soil surfaces. This will increase the chances of soil erosion. Unstable ground conditions (soil erosion and slope instability) are unfavourable conditions. Furthermore, blasting of certain rock formations may be required if found within the project area.</u>	MODERATE (-)	Slight	Study Area	Medium Term	Probable	Easily Achievable	<u>Disturbance and clearing of natural vegetation should be kept to the minimum required for construction. Newly cleared and exposed areas must be promptly rehabilitated with indigenous vegetation to avoid soil erosion. Where necessary, temporary stabilization measures must be used until vegetation establishes. Plan for the worst case, that is, for heavy rainfall and runoff events, or high winds. Appropriate erosion control measures must be implemented and a monitoring programme established to ensure that no erosion is taking place. At the first sign of erosion the necessary remedial action must be taken. Care must be taken to ensure that runoff is well dispersed so as to limit erosion. If soils are identified as highly conductive, cathodic protection for any underground power lines will be required and the use of imported quartz sand for pipe bedding. If there is slope instability, specific construction measures must be implemented to ensure stability of infrastructure. Blasting will be kept to a minimum and only undertaken for short periods of time if required. A geotechnical assessment must be undertaken post-EIA in order to determine the founding conditions, the blasting requirements and the design of the facility to ensure stability. This will be undertaken prior to submitting the final micro-sited layout to DEA for approval. Any approvals required will be applied for.</u>	LOW (-)
<i>Impacts on Surface and Groundwater Resources</i>	<u>Lifecycle of the project (all alternatives)</u>	Various substances may result in the pollution of surface and groundwater sources. Construction activities may lead to sediment being deposited into drainage lines, pollution from litter and general construction wastes may occur due to improper site management. Washing down of vehicles and equipment may result in the pollution of drainage areas, and pollution may occur from poor vehicle maintenance and improper storage of hazardous materials such as fuel, etc.	MODERATE (-)	Severe	Moderate	Long Term	May Occur	Easily Achievable	All hydrocarbons must be stored on impermeable surfaces with appropriately-sized containment bunds and grease traps. Traps must be regularly cleaned. All chemicals of all types must be stored on impermeable surfaces in secure and banded designated storage areas. Cement must be stored on impermeable storage areas protected from the rain and mixed only in designated areas. Cement residue must be cleaned up immediately. Vehicle repairs, servicing, refuelling and washing must be done only in designated areas with impermeable surfaces with appropriately-sized containment bunds and grease traps. Where it is necessary to service, repair or refuel a vehicle or item of plant in the field drip trays must be used to catch drips, spills and leaks. Spill kits must be available at all locations where chemicals of hydrocarbons are stored, handled or used, and spills must be cleaned up immediately in accordance with an established protocol appropriate to the material in question.	LOW (-)
IMPACTS ON THE BIOLOGICAL ENVIRONMENT										
<i>Disruption to terrestrial ecosystems</i>	<u>Lifecycle of the project (all alternatives)</u>	During the construction phase there may be impacts on natural vegetation and habitat including destruction of or damage to indigenous and riparian vegetation, the removal of intact communities, loss of	MODERATE (-)	Slight	Localised	Short Term	May Occur	Easily Achievable	The proposed development must be informed by provincial and local municipality land-use planning to ensure CBAs meet the biodiversity targets for ecosystems, species and ecological processes. This will be guided by a qualified ecologist. Work areas must be clearly demarcated with appropriate markings/barriers so that construction workers limit their activity to these areas alone. Where feasible, In areas to be disturbed, indigenous vegetation and species of special concern	LOW (-)

²⁰ Significance after mitigation.

		species of special concern and/or trees protected in terms of the Forest Act, and the introduction of alien species. The project site falls within CBAs and ESAs provided by relevant local and provincial spatial biodiversity plans. The removal and disturbance of faunal habitat may disrupt faunal movements, behaviour and feeding. During the operation phase there will be impacts on birds and bats. Bird fatalities will occur due to collision of rotor blades and bat fatalities will occur due to baro trauma.							must be removed and stored in an on-site nursery area for site rehabilitation. This process needs to be guided by a qualified botanist. Any necessary permits (i.e. in accordance with the National Forest Act, Nature Conservation Ordinance and NEMBA must be obtained prior to the removal of protected and/or threatened species. All construction vehicles must stay on single demarcated access tracks to avoid compaction of soil and roots. Rehabilitation should be undertaken in a progressive manner. Re-vegetation of the disturbed areas with indigenous material should be undertaken as soon as construction activities at an individual site have been completed. Only indigenous vegetation that occurs naturally on site is to be planted in site rehabilitation. The vegetation should be sourced from the on-site nursery as far as possible as recommended previously in this report. This process should be overseen by a qualified botanist. All alien vegetation must be removed from site and an alien monitoring programme should be initiated to ensure that the site remains clear of all alien vegetation. Safe cooking areas must be provided for staff and no open fires must be allowed on site. All construction staff must receive training on environmentally safe work methods. An ecological assessment, bird impact assessment and bat impact assessment will be undertaken in the EIA phase which will inform the mitigation measures and provide site-specific recommendations. <u>Mitigation and rehabilitation measures will be explored for any unavoidable residual impacts to ensure that the proposed projects are in accordance with the CBA and ESA management aims.</u>	
<i>Disruption to Aquatic Ecosystems</i>	<u>Lifecycle of the project (all alternatives)</u>	It is possible that some of the ecological functioning of drainage areas and/or surface water features may be impacted upon by the proposed project through access roads or underground cabling. There are rivers and wetlands of NFEPA status within the project area.	MODERATE (-)	Moderate	Localised	Short Term	May Occur	Easily Achievable	Sensitive aquatic features will be buffered if recommended by the aquatic specialist. All authorisations, if required, will be obtained from the DWS prior to commencing with the activity. A Stormwater Management Plan must be designed and implemented. The Management Plan must also include management mitigation measures for water pollution, waste water management and the management of erosion. <u>Mitigation and rehabilitation measures will be explored for any unavoidable residual impacts to ensure that the proposed projects are in accordance with the CBA and ESA management aims.</u>	LOW (-)
IMPACTS ON THE SOCIO ECONOMIC ENVIRONMENT										
<i>Health and Safety</i>	<u>Lifecycle of the project (all alternatives)</u>	Health and safety aspects will mostly pertain to activities defined under the Occupational Health and Safety Act (Act No. 85 of 1993).	LOW (-)	Slight	Localised	Short Term	May Occur	Easily Achievable	All aspects of the Occupational Health and Safety Act (Act No. 85 of 1993) must be adhered to at all times.	LOW (-)
<i>Impacts on Archaeological, Paleontological and/or Cultural Sites</i>	<u>Construction phase of all project components (i.e. all alternatives)</u>	It is possible that sites of archaeological, paleontological and/or cultural significance are present on or near the proposed development site. The presence of a WEF could indirectly affect the visual appeal of a cultural heritage	LOW (-)	Slight	Localised	Long Term	May Occur	Easily Achievable	Should any archaeological or cultural sites or objects be located during the construction of the proposed project, it should immediately be reported to the National Heritage Council. Failure to report a site or object of archaeological and/or cultural significance is a contravention of the National Heritage Resources Act (Act No. 25 of 1999). All construction site staff should be briefed to immediately report any sites or objects of heritage significance, which are located during the construction of the facility. In the event of finding what appears to be an archaeological site or a cultural and/or historic site or object, work within that area should be stopped until a qualified archaeologist or historian can examine the item or find.	LOW (-)
<i>Social disruptions</i>	<u>Construction phase (location alternative, construction camp location)</u>	Social disruptions may occur during the construction phase due to an influx of construction workers.	LOW (-)	Slight	Localised	Short Term	Definite	Easily Achievable	Set up the labour desk in a secure and suitable area, preferably in the communities where workers are being sourced, to discourage the gathering of temporary workers at the entrance and access roads to the construction site where it could affect road users and surrounding land owners. Mitigation measures for intrusion impacts (noise, visual, air and dust pollution) to be addressed in greater detail in the Socio-Economic Assessment in the EIA phase.	LOW (-)
<i>Social benefits – generation of electricity</i>	<u>Operational phase</u>	The WEF will contribute to the provision of electricity through the national grid.	MODERATE (+)	Moderately Beneficial	Extensive	Long term	Definite	Easily Achievable	A Socio-Economic Assessment will be undertaken in the EIA phase of the project to further determine the potential benefits arising from the generation of electricity.	HIGH (+)
<i>Social benefits –</i>	<u>Construction phase (location alternative,</u>	This would include the potential for the	LOW (+)	Moderately	Localised	Short term	Definite	Easily	As far as possible utilise local labour.	MODERATE

job creation	construction camp location) and to a lesser degree the operational phase	provision of employment in the short term and the utilisation of local businesses where possible.		beneficial					Achievable	As far as possible source construction material locally. A Socio-Economic Assessment will be undertaken in the EIA phase of the project to further assess the potential job creation and associated impacts.	(+)
CROSS CUTTING IMPACTS											
Increased traffic and the transport of abnormal loads	Construction phase (access roads, turbine positions, substation and construction camp locations)	During the construction phase large construction vehicles will be utilising the existing road network. This may result in the impeding of traffic flow and damage to the existing.	LOW (-)	Slight	Moderate	Short Term	Definite	Easily Achievable		Large construction vehicles must not utilise public roads during peak hours ²¹ , where feasible. Large construction vehicles must not be permitted to utilise public roads during peak hours. Damaged to public roads caused by large construction vehicles must be repaired immediately. A Traffic Impact Assessment will be undertaken post the EIA phase of the project. <u>Please note that a transport plan can only be compiled once the turbine model and turbine manufacturer are selected and the number of turbines are confirmed. Such a detailed study will be undertaken post-EIA once the information become known.</u> The project-specific impacts and mitigation measures will be included in the Environmental Management Programme. An abnormal load application will be submitted should the project be awarded preferred bidder status under the REIPPPP. No alteration or upgrades of the N1 are contemplated at this stage, however, if required the plans will be communicated to SANRAL as requested. Information on access will be shared throughout the EIA and the relevant forms will be submitted to SANRAL for consideration. At this stage it is unknown whether any services parallel within 60m to the N1 will be required. Should this be required in the future, the relevant work permission/ approvals will be applied for.	LOW (-)
Noise Impacts	Lifecycle of the project (all alternatives)	It is anticipated that there will be an increase in noise levels during the construction and operational phases of the proposed development.	MODERATE (-)	Moderate	Localised	Medium Term	Definite	Easily Achievable		Standard mitigation measures are available to reduce noise. A Noise Impact Assessment will be conducted in the EIA phase to further determine the potential noise impacts of the proposed development.	LOW (-)
Air Quality, including dust	Construction phase (location alternative)	Impacts on air quality during the construction phase will primarily result from increased dust levels associated with the required excavation, vegetation clearing, grading and other construction activities.	MODERATE (-)	Moderate	Localised	Short Term	Definite	Easily Achievable		Standard mitigation measures are available to reduce emissions. Project-specific mitigation measures and impacts will be further investigated in the Air Quality Assessment to be conducted in the EIA phase.	LOW (-)
Alignment with planning instruments	Lifecycle of the project	The proposed project is in line with the SDF, IDP of local and district municipalities as well as the NDP.	MODERATE (+)	Moderately Beneficial	Extensive	Long Term	Definite	Easily Achievable		No mitigation required	MODERATE (+)
Impact on SALT, SAAO	Lifecycle of the project	SALT and SAAO is sensitive to dust, light and other interferences that may visually obstruct viewing.	LOW (-)	Slight	Localised	Medium Term	Unlikely	Easily Achievable		<u>Mitigation measures to reduce potential light and dust pollution during the construction and operational stages of the Brandvalley wind energy facility will be included in the Environmental Management Plan (EMP). The SAAO will be afforded the opportunity to comment on these mitigation measures. Discussions will be advanced (outside of the EIA process) with the SAAO/SALT and the Civil Aviation Authority (CAA) in order to ensure that proposed mitigations accommodate the lighting requirements in accordance with the Civil Aviation Act 13 of 2009 and the Astronomy Geographic Advantage Act 21 of 2007.</u>	LOW (-)

²¹ Peak traffic hours refers to a part of the day during which traffic congestion on roads is at its highest. Normally, this happens twice every weekday—once in the morning and once in the evening, the times during when the most people commute, typically between 6:30-8:30 and between 16:30-18:30.

7.3 Gaps in Knowledge

Due to the complex and dynamic nature of the environment, uncertainty and gaps in our knowledge are inevitable. The Precautionary Principle has been adopted to account for this uncertainty throughout the Scoping Phase of the proposed project, and will similarly be implemented in the EIA Phase. The Precautionary Principle ensures that:-

- Uncertainty surrounding impacts are identified and addressed appropriately;
- Preventative measures are taken into account throughout the project;
- Various alternatives are thoroughly explored;
- Adequate and transparent public participation is conducted;
- A holistic approach is adopted to ensure social, economic and ecological impacts are explored, and mitigation measures are determined, through an integrated and balanced approach; and
- An adaptive approach is adopted to account for the complexities and dynamism inherent in environmental processes.

The Precautionary Principle ensures that potential impacts are predicted, avoided and mitigated to avoid threats of a serious or irreversible nature (IUCN, 2007).

As a result in gaps in specialist knowledge, detailed assessments will be undertaken during the EIA phase as described in Section 9.3.3.

8. PUBLIC PARTICIPATION PROCESS

According to Appendix 2(2) of the EIA Regulations (GN R. 982 of 2014), a *Scoping Report must contain all the information necessary for a proper understanding of the process, informing all preferred alternatives, including location alternatives, the scope of the assessment, and the consultation process to be undertaken through the environmental impact assessment process, and must include –*

(h) a full description of the process followed to reach the proposed preferred activity, site and location within the site, including–

(ii) details of the public participation process undertaken in terms of Regulation 41 of the Regulations, including copies of the supporting documents and inputs;

(iii) a summary of the issues raised by interested and affected parties, and an indication of the manner in which the issues were incorporated, or the reasons for not including them.

In line with the above-mentioned legislative requirement, this Chapter of the report provides the details of the Public Participation Process (PPP) conducted during the EIA process.

Since the two EIA processes are intended to run concurrently, some tasks for the PPP will be combined for Brandvalley and Rietkloof WEFs. Going forward the PPP will be split between the two facilities for written notification. Adverts and public meetings will remain combined.

Interested and Affected Parties (I&APs) play an important role in the EIA process, as many of their concerns and issues can be included in the project proposal, to ensure a development which is as environmentally and socially acceptable as possible. There are four key steps in the PPP to ensure that I&APs are informed of the proposed development and afforded sufficient opportunity to raise comments and or concerns. These include:

1. Identifying potential I&APs;
2. Notifying I&APs through:
 - i. Site notices;
 - ii. Written notice;
 - iii. Advertisements;
 - iv. Public meeting;
3. Making provision for I&APs to review and comment on all draft reports before they are finalised and submitted to the competent authority; and
4. Compiling a record of responses to any comments and concerns provided by the I&APs and including and addressing these concerns in final reports.

8.1 Identifying Potential Interested and Affected Parties

In the Pre-assessment Phase, prior to the Scoping Phase, CES identified any persons/organisations that were considered to have potential interest in the proposed project. This included government bodies, landowners, neighbours, extended neighbours (within 5km radius of the project area), organs of state, key stakeholders and any persons responding to the inception advertising or notification. A database comprising of all the relevant interested persons/organisation was compiled together with their contact details to inform them of the initiation of the project. The list of I&APs includes:

- Landowners adjacent and neighbouring the proposed site for development
- DEA Biodiversity
- Department of Environmental Affairs and Development Planning (DEA&DP)
- Department of Environment and Nature Conservation (DENC)
- Department of Defence (DoD)
- Department of Water and Sanitation (DWS)
- Department of Energy (DoE)
- Department of Agriculture, Forestry and Fisheries (DAFF)

- Western Cape Department of Agriculture
- Department of Science and Technology (DST)
- Department of Mineral Resources (DMR)
- South African Heritage Resources Agency (SAHRA)
- Heritage Western Cape (HWC)
- Northern Cape Provincial Heritage Resources Authority (NCPHRA)
- Ward councillors and representatives
- Ratepayers Associations
- Farmers Association
- Cape Nature
- South African Civil Aviation Authority (SACAA)
- South African Astronomical Observatory (SAAO)
- South African Large Telescope (SALT)
- Square Kilometre Array (SKA)
- Endangered Wildlife Trust (EWT)
- Air Traffic and Navigation Services (ANTS)
- Wildlife and Environment Society of South Africa (WESSA)
- South African Weather Service (SAWS)
- Birdlife South Africa
- Eskom
- Sentech
- Telecommunication service providers
- Provincial and District Roads Departments
- South African National Roads Agency Limited (SANRAL)
- Non-governmental Organisations (NGOs) and Community Based Organisations (CBOs)
- Witteberg Private Nature Reserve
- Namakwa District Municipality
- Cape Winelands District Municipality
- Central Karoo District Municipality
- Witzenberg (Ceres) Local Municipality
- Laingsburg Local Municipality
- Karoo Hoogland Local Municipality
- Various Ward Councillors:
 - Ward 12 Councillor of the Witzenberg (Ceres) Local Municipality
 - Ward 4 Councillor of the Witzenberg (Ceres) Local Municipality
 - Ward 3 Councillor of the Karoo Hoogland Local Municipality
 - Ward 1 Councillor of the Laingsburg Local Municipality
- Laingsburg Tourism

The list of I&APs is provided in Appendix C-2.

8.2 Notifying Interested and Affected Parties of the EIA

According to Section 41(2) of the EIA Regulations (GN R.982 of 2014):

The person conducting a public participation process must take into account any relevant guidelines applicable to the public participation as contemplated in section 24J of the Act and must give notice to all potential interested and affected parties of an application or proposed application.

As indicated above and discussed below, I&APs will be notified through the following:

- Site notices;
- Written notice;
- Advertisements; and
- Public meeting.

8.2.1 Site Notice

Section 41(2) of the EIA Regulations (GNR 982 of 2014) requires:
 (a) *Fixing a notice board at a place conspicuous to and accessible by the public at the boundary, on the fence or along the corridor of -*
 (i) *The site where the activity to which the application or proposed application relates is or is to be undertaken; and*
 (ii) *Any alternative site.*

Section 41 (3) of the EIA Regulations (GNR 982 of 2014) requires:
A notice, notice board or advertisement referred to in subregulations (2) must –
 (a) *give details of the application or proposed application which is subjected to public participation; and*
 (b) *state –*
 (i) *whether basic assessment or S&EIR procedures are being applied to the application;*
 (ii) *the nature and location of the activity to which the application relates;*
 (iii) *where further information on the application or proposed application can be obtained; and*
 (iv) *the manner in which and the person to whom representation in respect of the application or proposed application may be made.*

Section 41 (4) of the EIA Regulations (GNR 982 of 2014) requires:
A notice board referred to in subregulation (2) must –
 (a) *be of a size at least 60cm by 42cm; and*
 (b) *display the required information in lettering and in a format as may be determined by the competent authority.*

In accordance with this requirement and with Section 41(4), three (3) 800x600mm single sided foam-board mounted notice boards were placed on the boundary of the proposed project area on Thursday 30th July 2015. The locations, content and photographs of the fixed notices are provided in Appendix C-5. Table 8-1 below provides the coordinates of the site notices placed.

Table 8-1: Coordinates of Site Notices Placed.

Site Notices	Latitude	Longitude
Site Notice 1	-33.08177900	20.59238100
Site Notice 2	-32.95112100	20.54862200
Site Notice 3	-33.22319900	20.58149100

In addition, posters, in Afrikaans and in English, were placed at the Municipal Building in Laingsburg, at the Laingsburg Public Library and at Touws River Public Library on the 31st of July 2015. Copies of the poster and photographs of the placed posters are provided in Appendix C-5.

8.2.2 Written Notices

Section 41(2) of the EIA Regulations (GNR 982 of 2014) requires:
 b) *Giving written notice, in any of the manners provided for in Section 47D of the Act, to:*
 (i) *The occupiers of the site and, if the proponent or applicant is not the owner or person in control of the site on which the activity is to be undertaken, the owner or person in control of the site where the activity is or is to be undertaken or to any alternative site where the activity is to be undertaken;*
 (ii) *Owners, persons in control of, and occupiers of land adjacent to the site where the activity is or is to be undertaken or to any alternative site where the activity is to be undertaken;*
 (iii) *The municipal councillor of the ward in which the site or alternative site is situated and any organisation of ratepayers that represent the community in the area;*
 (iv) *The municipality which has jurisdiction in the area;*
 (v) *Any organ of state having jurisdiction in respect of any aspect of the activity; and*
 (vi) *Any other party as required by the competent authority.*

In accordance with this requirement, written notices were distributed via email or registered post to all I&APs as identified by EOH CES. There have been two rounds of notification letters to date, including notification letters to:

1. Inform I&APs of the proposed project – sent on the 27th of August 2015.

The initial round of notification letters served to inform all I&APs of the proposed WEFs and provided a web link to the Background Information Document (BID), available in both English and Afrikaans. The BID provided basic preliminary information on the proposed project, the EIA process and contact details for registration as an I&AP. Hard copies of the BID were provided on request. The BID is reproduced in Appendix C-1.

2. Inform I&APs of the release of the

The second round of notification letters were circulated to inform all I&APs of the release of the Draft Scoping Report (DSR) for the proposed Brandvalley WEF project for public review. The notification letters provided information regarding the review period (from 25 January 2016 until 23 February 2016), where the DSR can be accessed and details regarding the open day and public meeting.

The DSR was available at the Laingsburg Public Library, the Touws River Public Library and electronically on both the G7 and EOH CES websites. Proof of the availability of the report is provided in Appendix C-4.

I&APs whose email notification that could not be delivered, were notified via registered mail on the 29th of January 2016 and were informed of the extended comment period until Monday 29th of February 2016.

Copies of the written letters are provided in Appendix C-3.

Any persons/organisation that has requested to be registered as an I&AP since the date on which the written notices were distributed and the adverts were placed, has been added to the I&AP database and has received a BID. These I&APs will be kept informed throughout the EIA process.

8.2.3 Advertisements

Section 41(2) of the EIA Regulations (GNR 982 of 2014) requires:

- (c) *Placing an advertisement in:*
- (i) *One local newspaper; or*
 - (ii) *Any official Gazette that is published specifically for the purpose of providing public notice of applications or other submissions made in terms of these Regulations;*
- (d) *Placing an advertisement in at least one provincial newspaper or national newspaper, if the activity has or may have an impact that extends beyond the boundaries of the metropolitan or district municipality in which it is or will be undertaken: Provided that this paragraph need not be complied with if an advertisement has been placed in an official Gazette referred to in paragraph.*

Advertisements placed in the Pre-Assessment PPP phase to notify I&APs of the proposed project were placed in two Provincial Newspapers (*Die Beeld* on 27 August 2015 in Afrikaans and *The Cape Times* on 27 August 2015 in English) and in one local newsletter (*Die Windpomp Nuusbrieff*) on 27 August 2015 in order to:

- Inform the wider public of the intention to undertake an EIA for the proposed project, and;
- Invite them to register as I&APs.

Advertisements were placed in two Provincial Newspapers (*Die Volksblad* on the 27th of January 2016 and in *Die Burger* on the 25th of January 2016, both in Afrikaans) and in one Local Newspaper (*Die Noordwester* in English) on 29th January 2016 to notify I&APs of the availability of the DSR and to invite them to attend the public meeting.

A copy of the advertisements, in Afrikaans and English, are included in Appendix C-4.

8.3 Public Review Period of Draft Scoping Report and Public Meetings

Section 43 of the EIA Regulations (GNR 982 of 2014) requires:

- (1) *A registered interested and affected party is entitled to comment, in writing, on all reports or plans submitted to such party during the public participation process contemplated in these Regulations and to bring to the attention of the proponent or applicant any issues which that party believes may be of significance to the consideration of the application, provided that the interested and affected party discloses any direct business, financial, personal or other interest which that party may have in the approval or refusal of the application.*
- (2) *In order to give effect to section 140 of the Act, any State department that administers a law relating to a matter affecting the environment must be requested, subject to regulation 7(2), to comment within 30 days.*

The Draft Scoping Report was made available for public review from the **Monday 25 January 2016 to Tuesday 23 February 2016** (30 calendar days), extended to 29 February 2016. The documents were made available through the following methods:

1. Hard copies of the Draft Scoping Report have been made available at: Laingsburg Public Library (Van Riebeeck Street, Laingsburg) and the Touws River Public Library (Corner Jane and Logan Streets Touws River).
2. Hard/ electronic copies will be circulated to organs of state to request comments.
3. Electronic copies available on the link (<http://data.g7energies.com/eia/brandvalley>) and link (www.cesnet.co.za/public-documents).

Section 41(2) of the EIA Regulations (GNR 982 of 2014) requires:

- (e) *Using reasonable alternative methods, as agreed to by the competent authority, in those instances where a person is desirous of but unable to participate in the process due to-*
 - (i) *Illiteracy;*
 - (ii) *Disability; or*
 - (iii) *Any other disadvantage.*

During the 30 day public review period (**Monday 25 January 2016 to Tuesday 23 February 2016**) for this Draft Environmental Scoping Report an open day and a public meeting was held on **Thursday the 11th February 2016 from 15h30**. Notice of this was advertised in the *Die Burger* (Afrikaans), *Die Volksblad* (Afrikaans) and in *The Noordwester* (English) prior to the meeting. All registered I&APs to date were informed in writing of the meeting venue and date, along with all other significant stakeholders engaged with to date.

Minutes were taken during the public meeting, including all comments and questions from I&APs in attendance as well as any responses given from the EAP (Marc Hardy) or the applicant. The minutes are available in Appendix C-6.

8.4 Interested and Affected Parties Database

Section 42 of the EIA Regulations (GNR 982 of 2014) requires:

A proponent or applicant must ensure the opening and maintenance of a register of interested and affected parties and submit such a register to the competent authority, which register must contain the names, contact details and addresses of-

- 1) *All persons who, as a consequence of the public participation process conducted in respect of that application, have submitted written comments or attended meetings with the proponent, applicant or EAP;*
- 2) *All persons who have requested the proponent or applicant, in writing, for their names to be placed on the register; and*
- 3) *All organs of state which have jurisdiction in respect of the activity to which the application relates.*

A Register or Database has been created with all I&APs to date containing the relevant contact person's names, contact details and addresses made available. The Register will be updated throughout the Scoping and EIA process to include all I&APs' contact details of those who responded to the advertisement(s) and/or registered as I&APs. The Register to date is provided in Appendix C-2.

8.5 Comments from Interested and Affected Parties

Section 44 of the EIA Regulations (GNR 982 of 2014) requires:

- (1) *The applicant must ensure that the comments of interested and affected parties are recorded in reports and plans that such written comments, including the responses to such comments and records of meeting, are attached to the reports and plans that are submitted to the competent authority in terms of these Regulations.*
- (2) *Where a person desires but is unable to access written comments as contemplated in sub regulation (1) due to –*
 - (i) *lack of skills to read or write;*
 - (ii) *disability; or*
 - (iii) *any other advantage;**Reasonable alternative methods of recording comments must be provided for.*

A record of all comments and/or issues received by I&APs, together with a note of the responses given, was maintained in a Comments and Response Table (Appendix C-6). If requested, reasonable alternative methods of recording comments will be provided for.

To date, the following comments were received from Interested and Affected Parties:

- Mr Matthys L. Heyns indicated support for the proposed project
- SANRAL provided information on the potential permits and approvals required for the transportation of abnormal loads, any upgrades to existing national roads and indicated information requests and the need to consult with them.
- Mr Steve Swanepoel raised an objection to the proposed project based on concerns relating to impacts on the existing airstrip, impacts to the character of the Karoo, tourism, visual impacts, ecological impacts, the viability of the project and socio-economic impacts.
- Falcon Oil and Gas commented on the impact the proposed wind farm would have on their shale gas fracking plans within the same area as the wind farm.
- Mr Cornelius P. Willemse requested that the area be fenced off.
- Sentech commented that there will be no impact on any of the Sentech networks, because of remote location of the WEF.
- Mr Warren Petterson, a nearby landowner submitted his objection followed by comments and concerns on the proposed project.
- Eskom (John Geeringh) provided requirements for works at or near Eskom infrastructure.
- The Department of Environmental Affairs and Development Planning (DEADP) provided comments on the proposed project including comment on the proposed listed activities and an indication of which impacts are to be assessed in the EIA Phase of the proposed project.
- South African Astronomical Observatory (SAAO) informed that the proposed facilities are within the Sutherland Central Astronomy Advantage Areas declared by the Minister of Science and Technology and requested that light and dust pollution are included in the assessment and that mitigation measures are provided to minimise the potential impacts.
- Square Kilometre Array (SKA) informed that the nearest SKA station is SKA-2379 approximately 75km from the proposed location and therefore the WEF poses a very low risk of detrimental impact on SKA and thus no mitigation measures are required at this stage.
- CapeNature provided comments on the proposed project including: a request for clarity on certain project information; a request for the implementation of the precautionary approach to the proposed project; comment on the specialist assessments and monitoring to be undertaken; information regarding the biophysical environment and sensitive areas (CBAs, ESAs and FEPAs) and certain requirements/requests from CapeNature.

8.6 Summary of Public Participation Tasks undertaken and scheduled for the EIA phase

The Public Participation Process will be divided into three phases which will allow for stakeholder engagement at a Pre-assessment Phase, a Scoping Phase as well as at the EIA phase. The tasks which will be carried out at each phase are described in the table below:

Table 8-2: Summary of Public Participation Process in the Scoping and EIA Process.

Date	Phase	Meeting and/or deliverable	Objective
14 July 2015	Pre-Assessment	Meeting with the DEA	A pre-application meeting was held with the applicant, environmental consultant and DEA to determine and clarify the appropriate way forward to conduct the Environmental Impact Assessment for the proposed Brandvalley and Rietkloof Wind Energy Facilities (WEF).
30 July – 27 August 2015		Distribute pre-assessment notifications as stipulated in the Sections outlined above	To inform all I&APs of the proposed project and to comply with Section 41 of the EIA Regulations.
14 – 18 December 2015		Compile Comments and Response Table	As per legal requirements all issues and/or comments raised by registered interested and affected parties needs to be documented in writing and responded to by the EAP.
25 January 2016- 23 February 2016 (extended until 29 February 2016)	Scoping Phase	Distribute notifications of the availability of the Draft Scoping Report (DSR) for public review as stipulated in the Sections outlined above	To inform I&APs of release of DSR and to comply with Section 40 of the EIA Regulations.
11 February 2016		Open House/Public Meeting	In order to inform all I&APs of the outcome of the Scoping Report.
3 March 2016		Comments received on the Draft Scoping Report will be compiled into a Comments and Response Table. This Comments and Responses Table will be circulated to all parties who provide comments and will be included to the Final Scoping Report for submission to DEA.	As per legal requirements all issues and/or comments raised by registered interested and affected parties needs to be documented in writing and responded to by the EAP. Decision making by the DEA on the acceptability of the plan of study for EIA.
23 May 2016 – 22 June 2016	EIA Phase Notification of the decision	Distribute notifications of the availability of the Draft EIR for public review as stipulated in the Sections outlined above	To inform I&APs of release of DEIR and to comply with Section 40 of the EIA Regulations.
02 June 2016		Hold open house event	In order to ensure that all I&APs have the opportunity to provide input to the proposed project and have their concerns addressed.
23 May 2016 - 13 July 2016		Compile Comments and Response Table for incorporation into the Final EIR and circulation to all parties who submitted comments.	As per legal requirements all issues and/or comments raised by registered interested and affected parties needs to be documented in writing and responded to by the EAP
01 November 2016		All registered interested and affected parties will be notified of the decision taken by the DEA to either reject the project or issue an environmental authorisation. Notification will be done through written notification. The wider public will be informed of the decision through advertisements.	Inform all interested parties of the DEA's decision in accordance with Section 4 (2) of the 2014 EIA Regulations.

9. PLAN OF STUDY FOR EIA

According to Appendix 2(2) of the EIA Regulations (GNR 982 of 2014), a *Scoping Report must contain all the information necessary for a proper understanding of the process, informing all preferred alternatives, including location alternatives, the scope of the assessment, and the consultation process to be undertaken through the environmental impact assessment process, and must include –*

- (i) a plan of study for undertaking the environmental impact assessment process to be undertaken including –*
 - (i) a description of the alternatives to be considered and assessed within the preferred site, including the options of not proceeding with the activity;*
 - (ii) a description of the aspects to be assessed as part of the environmental impact assessment process;*
 - (iii) aspects to be assessed by specialists;*
 - (iv) a description of the proposed method of assessing the environmental aspects, including aspects to be assessed by specialists;*
 - (v) a description of the proposed method of assessing duration and significance;*
 - (vi) an indication of the stages at which the competent authority will be consulted;*
 - (vii) particulars of the public participation process that will be conducted during the environmental impact assessment process; and*
 - (viii) a description of the tasks that will be undertaken as part of the environmental impact assessment process;*
 - (ix) identify suitable measures to avoid, reverse, mitigate and manage identified impacts to determine the extent of the residual risks that need to be managed and monitored.*

In line with the above-mentioned legislative requirement, this Chapter sets out the Plan of Study (PoS) for the EIA Phase of the assessment.

9.1 Alternatives

Fundamental Alternatives, Incremental Alternatives and the No Development Alternative have been described in Chapter 3 of this Scoping Report. A short summary of alternatives proposed for assessment during the EIA phase are provided below.

9.1.1 Fundamental Alternatives

Fundamental alternatives are developments that are entirely different from the proposed project and usually involve a different type of development on the proposed site, or a different location for the proposed development.

Location Alternatives

The project proponent conducted various steps in the site selection process for the proposed project. The process included integrated spatial, environmental and technical feasibility assessments with input from internal sources and external stakeholders, such as consultants, landowners and authorities.

The project area selection process has been considered from the following perspectives:

- National – consideration of the potential development sites from various locations within the borders of South Africa, using predetermined criteria, including environmental, legislative and technical.
- Regional – determination of the suitability of positioning of the site within a chosen locality using evaluative spatial, technical and legal parameters.
- Local – detailed evaluation of factors that influence project feasibility and the optimal location of the project infrastructure within the site boundaries.

The following steps were taken to determine the preferred location alternative:

National Alternatives

1. An Environmental and Social Pre-feasibility Assessment was undertaken by CES in 2009, to determine the wind resource and site suitability of fourteen sites/areas in South Africa, taking into consideration the following key factors:
 - Noise
 - Visual impact;
 - Avifauna (birds and bats);
 - Terrestrial ecology (fauna and flora);
 - Hydrology Impact Considerations;
 - Heritage Impact Considerations;
 - Road Access and Power line Servitudes;
 - Potential Safety Impact Considerations;
 - Proximity to airfields; and
 - Proximity to other potential wind farm developments.

The high level assessment determined the significance of the environmental and socio-economic issues, potential fatal flaws and to rank the sites. The pre-feasibility assessment determined that two sites namely Swellendam 2 and Uitvlugt are potentially fatally flawed. Although the other sites had various areas of concern/ risk they were not deemed fatally flawed from an environmental and social perspective.

2. Further considerations were incorporated into the site selection process undertaken by the developer, including:
 - Wind resource;
 - Site extent;
 - Grid access;
 - Land suitability;
 - Proximity to aerodromes; and
 - Landowner support.

Regional Alternatives

The project proponent proceeded with researching the greater Roggeveld area and commenced with an EIA for a 750MW WEF, which was separated into various 140MW WEF phases as per the request from the DEA and in accordance with the maximum generation capacity per WEF as stipulated under the DoE REIPPPP. The initial detailed EIA conducted on the 750MW Roggeveld WEF, an assessment undertaken for Phase 2 of the greater development (Karreeboach WEF), which received Environmental Authorisation in January 2015, and wind modelling indicated that the high wind resource and acceptable risk of environmental impacts contribute to the suitability of the proposed Roggeveld area, including Brandvalley WEF.

As an alternative, a fifth phase located immediately southwest of the current Brandvalley project site was considered for potential project development, but was considered no-go for wind farm development.

Phase 5 consisted of the properties immediately southwest of Brandvalley, up to about 13km away where the terrain falls off into the southern tips of the comparatively flat Tankwa Karoo. According to the applicant's wind map this region exhibits even better wind resources than phase 1 (Roggeveld Wind Farm) due to the presence of many elongated mountain ridges which are ideally exposed to the prevailing wind directions. The area was also expected to have similar ecological sensitivities to Roggeveld due to the comparable biophysical environment. However, this alternative proved infeasible due to the fact that none of the affected landowners were open to the idea of wind energy development on their properties. All further assessments and investigations therefore did not progress any further.

Local alternatives

The main project components are the wind turbines themselves which inform the layout of associated infrastructure such as roads, crane pads, substation positions or power lines. Within the Brandvalley area, detailed consideration was given to selecting areas that would be suitable for turbine placement or project infrastructure. In the selection process some alternative areas were eliminated for the following reasons:

- Wind resources;
- Buildable areas; and
- Landowner input.

Therefore, no further site location alternatives other than Brandvalley will be considered in the EIA process. The detailed and rigorous pre-feasibility assessment undertaken to select the site (from 14 others) provides a reasonable justification for not considering any further alternatives for the current EIA process.

One feasible location alternative will be assessed namely Brandvalley WEF as indicated in Figure 2-1.

Access road location alternatives

Two access road alternatives were identified during the preliminary design of the wind farm namely:

- Access road alternative 1 is proposed to start from the R354 and follow the existing gravel road to a western direction. Various side roads branch from this main access road in all directions order to connect the various ridges where turbines are proposed to the main access road.
- Access road alternative 2 is south of alternative 1 and is also proposed to start from the R354 and follow an existing farm access road in a western direction. From this alternative main access road various roads will branch to north, west and east directions.

Please note that the main access road sections i.e. the point of access from the R354 and a short road section are the main difference between the two alternatives as the secondary roads branching to connect the ridges will be assessed in both access road alternatives.

Two access road alternatives will be assessed. Each road section will be buffered by 200m in order to allow for incremental alternatives i.e. reroute within the buffer in order to avoid any sensitive features that could be identified during the detailed specialist assessments.

Three Construction camp location alternatives

Three construction camp alternatives layouts will be assessed during the EIA phase namely:

- Construction camp alternative 1 located adjacent and to the south of the point where access road alternative 1 connects to the R354.
- Construction camp alternative 2 is located adjacent to a proposed secondary access road immediate north of the centre of the facility.
- Construction camp alternative 3 is located immediate west of the centre of the facility adjacent to a secondary access road.

Four Substation location alternatives

Four identified substation positions were based on a technical study to limit overall line length of internal park cabling and losses based on different turbine layouts (up to 70 turbines depending on generator size), economic and environmental optimisation with cutting down number of electrical strings and cable trenches, slope analysis of suitable positions for earthworks and levelling and

optimised 132kV line routing. Four substation location alternatives were identified during preliminary designs for assessment during the EIA phase:

- Substation alternative 1 is proposed adjacent and to the south of the main access road alternative 1 approximately 2.7km from the R354.
- Substation alternative 2 is proposed adjacent and to the south of a secondary road extending from the main access road alternative 1.
- Substation alternative 3 is proposed adjacent to a secondary road north-east from the centre of the facility.
- Substation alternative 4 is proposed adjacent to a secondary road in close proximity to construction camp alternative 3.

Technology Alternatives

Various technology alternatives to wind energy were deemed inappropriate for the site based on the following in addition to the motivation provided in Chapter 4:

- solar energy developments require areas with high solar radiation and large, flat terrain. However, the site is very hilly with prominent ridgelines with slopes that are unsuitable for large photovoltaic or solar concentrator arrays. In addition, areas much further north in the Northern Cape have much higher solar irradiation values than the Karoo as the latter suffers from frequent winter and summer cloud cover;
- the site is very dry with slow growing, sparse vegetation unsuitable for a biomass or biogas project;
- there is no coal deposits in the region suitable for a coal fired power station;
- there is not enough water available for the cooling requirements of a nuclear power station; and
- the exact quantity, location and economic recoverability of shale gas resources are still very uncertain in the Karoo, apart from the risks of contaminating underground aquifers through hydraulic fracturing activities. A gas fired power plant is therefore also not feasible in this area.

Therefore, no technology alternatives are feasible for assessment at this stage of the project other than a wind energy facility

9.1.2 Incremental Alternatives

Incremental alternatives are modifications or variations to the design of a project that provide different options to reduce or minimise environmental impacts. Turbine layout is considered to be an incremental alternative.

Turbine Layout Alternatives

The detailed specialist assessments, on-going bird and bat monitoring campaigns and comments from interested and affected parties may identify no-go development zones, which likely are to be recommended to be excluded from the Brandvalley layout site areas. Therefore, incremental alternatives to be considered in the EIA Phase include alternative turbine positions.

Incremental alternatives that will be considered in the EIA Phase include alternative turbine positions, alternative turbine designs (e.g. alternative rotor diameter or hub heights).

9.1.3 No-Go development

It is mandatory to consider the “no-go” option in the EIA process. The no development alternative option assumes the site remains in its current state, i.e. there is no construction of a WEF and associated infrastructure in the proposed project area. The no-go alternative will be assessed in an objective manner in the EIA Phase.

9.2 Project Description

The aspects to be assessed as part of the EIA are provided in the table 9-1 below. A more detailed description of the proposed activities is provided in Chapter 2 of this Scoping Report.

Table 9-1: Activities and associated infrastructure to be assessed in the EIA Phase.

Technical details of the proposed facility	
Energy generation capacity (at point of grid feed-in)	Maximum 140MW
Number of turbines	Approximately 70, between 1.5MW and 4MW in capacity each
Turbine foundation	25m in diameter and 4m in depth
Turbine hub height	120 m
Rotor Diameter	140 m
Permanent laydown area ²² (for each turbine)	70m x 50m (each), total 24.5ha (for all turbines)
Electrical turbine transformers (adjacent to each turbine)	690V/33kV, footprint of between 2m x 2m and 10m x 10m.
Cabling	Underground 33kV cabling between turbines buried along access roads, where feasible.
Internal Access Roads	Up to 12m wide, including structures for stormwater control would be required to access each turbine location and turning circles. Where possible, existing roads will be upgraded.
Overhead power lines	33kV overhead power lines linking groups of wind turbines to onsite 33/132kV substation(s).
Onsite substation	A number of potential 33/132kV onsite substation location(s) will be assessed.
Wind measuring lattice masts	4 x 120m, strategically placed within the wind farm development footprint to collect data on wind conditions during the operational phase.
Temporary Infrastructure	
Construction camp	~10ha
On-site concrete batching plant	~1ha
Borrow pits and quarries ²³	~4.5ha
Fencing ²⁴	~4m (height)

The following infrastructure will likely be ceded to Eskom at a later stage and will therefore be assessed in a separate Basic Assessment process:

- High voltage components of the 33/132kV onsite substation including transformers, isolators, cabling, light mast and other as required by Eskom. The onsite substation would have a footprint of up to 200m x 200m that would also house site offices, storage areas, ablution facilities and the maintenance building.
- 132kV above-ground distribution line to connect the onsite 33/132kV substation to the grid. The pylons for this line will have an average spacing of 250m to 300m.

²² Laydown areas will be required during construction and for ongoing maintenance purposes.

²³ All materials excavated will eventually be used on the compacting of the roads and hardstanding areas and no material will be sold to any third parties. The number and size of the borrow pits depends on suitability of the subsurface soils and the requirement for granular material for access road construction and other earthworks. Alternative borrow pit locations will be assessed in a separate BA process.

²⁴ Fencing will be limited around the construction camp and the entire facility would not necessarily need to be fenced off.

- Extension of the national grid in order to connect the wind farm. There are three options being considered and the preferred option will be informed by environmental, technical considerations and Eskom’s preference:
 - Extension of the existing 400kV Komsberg substation with several electrical components to be defined by Eskom (e.g. additional feeder bay, transformer bay) on the existing substation property;
 - Extension of the Bon Espirange satellite 132kV substation with several electrical components. The Bon Espirange satellite substation will be established by Eskom and other IPPs as an alternative to connecting all wind farms west of Komsberg directly to the Eskom Komsberg Substation; or
 - Construction of a central switching station (up to 200m x 200m) to be shared by both Brandvalley and Rietkloof if both are awarded preferred bidders. If the central hub or switching station option is ultimately selected by Eskom, each project will build their own 33/132kV substation and connect to the central station. From there one 132kV line for both projects will lead to either the Komsberg or Bon Espirange substation.

Potentially Shared infrastructure

Depending on Eskom’s requirements it might be feasible for both Brandvalley and Rietkloof to connect to a shared onsite 33/132kV substation, which could then be connected via an off-site overhead 132kV power line to Komsberg Substation. The latter could then be shared by both facilities. This would be assessed as a potential connection alternative in a separate Basic Assessment process.

Access roads, laydown areas, borrow pit locations and buildings and other infrastructure will also be shared as far as feasibly possible.

9.3 Scope and Intent of the EIA Phase

The purpose of the EIA would be to undertake a comparative assessment of the relative significance of the potential environmental impacts for the proposed WEF and the identified feasible alternatives. The EIA report would include all information as required in Appendix 3 of the 2014 EIA Regulations (GN R982).

9.3.1 Proposed Structure of EIR

To avoid the EIR being excessively long and cumbersome, whilst meeting the content requirements specified in the NEMA EIA Regulations, the final report will be divided into a number of volumes indicated in Table 9-2 below.

Table 9-2: Volumes that will be generated in the EIA phase for the proposed project.

Volume Number	Report	Contents
1	Scoping Report	As per the Draft Scoping Report (this report)
2	Environmental Impact Report (EIR)	This volume will include - <ol style="list-style-type: none"> 1. Introduction <ul style="list-style-type: none"> ● Detail and expertise of the EAP who compiled the report 2. Description of the Project <ul style="list-style-type: none"> ● A description of the property on which the activity is to be undertaken ● The location of the activity on the property ● A description of the types of activities that are proposed for the development. 3. Alternatives Considered <ul style="list-style-type: none"> ● Description of all alternatives considered in the EIA 4. Description of the Affected Environment <ul style="list-style-type: none"> ● The natural environment

		<ul style="list-style-type: none"> • The socio-economic environment • The legal, policy and planning setting <p>5. The Public Participation Process</p> <ul style="list-style-type: none"> • Steps undertaken in order to notify and involve I&APs • Advertisements and media • Meetings held in the PPP • Issues and Comment Trail management • Summary of comments and issues raised by I&APs and responses to the issues <p>6. Summary of Specialist Reports</p> <ul style="list-style-type: none"> • Summary of the findings and recommendations of all specialist studies <p>7. The Significance of Potential Environmental Impacts</p> <ul style="list-style-type: none"> • The methodology used to determine the significance of environmental impacts • Impacts on the natural environment • Impacts on the socio-economic environment • Impacts on the legal, policy and planning setting <p>8. Environmental Impact Statement</p> <ul style="list-style-type: none"> • A summary of the key findings of the EIA • Comparative assessment of the positive and negative implications of the proposed activity and identified alternatives • A statement/recommendation on whether the project can proceed based on the information at hand <p>9. Conclusions</p> <ul style="list-style-type: none"> • Overview of the findings and outcomes of this EIA • Any conditions that should be made in respect to any form of authorisation. <p><i>It should be noted that the above is not the exact Table of Contents for the EIA, but is intended to indicate the major topics that will be covered in the report.</i></p>
3	Specialist Studies	<p>This volume will be a compilation of all the specialist studies undertaken in the EIA, and will include assessments of -</p> <ul style="list-style-type: none"> • Visual impacts • Heritage resources on site • Noise impacts • Ecological impacts • Avifauna and Bat impacts • Agricultural impacts • Socio-economic impacts • Aquatic impacts
5	Environmental Management Programme (EMPr)	<p>EMPr for key activities of the proposed project, which will contain the following -</p> <ol style="list-style-type: none"> 1. Introduction <ul style="list-style-type: none"> • The details of the EAP who prepared the EMPr • The expertise of the EAP to prepare an EMPr 2. Detailed description of the aspects of the activity covered by the EMPr's 3. Mitigation Measures and Actions <ul style="list-style-type: none"> • Planning and Design • Pre-construction and construction activities • Operation and undertaking of the activity • Rehabilitation of the environment 4. Responsibilities

		<ul style="list-style-type: none"> • Persons responsible • Time periods for implementation
5. Monitoring Programme		

9.3.2 Environmental Impact Report (EIR)

The main purpose of the EIR is to gather and synthesise environmental information and evaluate the overall environmental impacts associated with the development, to consider mitigation measures and alternative options, and make recommendations in choosing the best development alternative. The EIR also identifies mitigation measures and management recommendations to minimise negative impacts and enhance benefits. The EIR and associated specialist reports are made available for public and authority review and comment. The availability of the report will be advertised in one Provincial and one local newspaper and the report will also be made available for public scrutiny in easily accessible locations.

9.3.3 Specialist Studies

Specialist studies identified during the Scoping Phase as being necessary, plus any additional studies that may be required by the authorities to inform the EIA, will be undertaken during the EIA. Appropriately qualified and experienced specialists will be appointed to undertake the various assessments As per the Terms of References included in Section 9.4.

A number of the potential environmental impacts identified during the Scoping Phase require further specialist investigation. It is proposed that the following assessments be undertaken to inform the EIA:

Specialist field	Specialist		Peer review required by DEA
Archaeological Impact Assessment	Ms Celeste Booth	Booth Heritage Consulting (Pty) Ltd	No
Agricultural Impact Assessment	Mr Roy de Kock	EOH CES	Yes
Aquatic Impact Assessment	Dr Brian Colloty	Scherman Colloty & Associates (SC&A)	No
Avifaunal Impact Assessment	Dr Tony Williams	African Insights	No
Bat Impact Assessment	Mr Werner Marais	Animalia Zoological & Ecological Consultation CC	No
Ecological Impact Assessment	Mr Simon Todd	Independent Ecological Consultant	No
Heritage Screeners	Mr Nicholas Wiltshire	Cedar Tower Services	No
Heritage Impact Assessment	Ms Celeste Booth	Booth Heritage Consulting (Pty) Ltd	No
Noise Impact Assessment	Dr Brett Williams	Safetech	No
Socio-Economic Impact Assessment	Mr Tony Barbour	Independent Consultant	No
Visual Assessment Specialist	Mr Thomas King	EOH CES	Yes

Heritage Western Cape will provide comment on the Heritage Screener and the Notification of Intent to Develop. Depending on the response from HWC, a Paleontological Impact Assessment (PIA) may be required.

A Traffic Impact Assessment and a Geotechnical Assessment will be undertaken at a later stage once the turbine specifications, the number of turbines and the turbine locations have been determined, provided positive Environmental Authorisation is granted. This will not form part of the Environmental Impact Assessment process.

The Terms of References for the above studies are included in Section 9.4 below.

9.3.4 Environmental Management Programme (EMPr)

The EMPr will be informed by recommendations made by specialists to reduce negative impacts if it cannot be avoided altogether and or enhance positive impacts. The EMPr will be circulated with the EIA for comment. Should the DEA decide to issue a positive EA, the EMPr will be included as a

condition for authorisation to ensure that this is implemented and adhered to. The EMPr will be compiled to meet the requirements of Appendix 4 of the 2014 EIA Regulations.

9.3.5 Record of Decision and Appeals Process

Upon thorough examination of the EIR, the authority will issue a decision, which either authorises the project or rejects it. Should a positive Environmental Authorisation be granted, it usually carries Conditions of Approval. The proponent is obliged to adhere to these conditions. Once the decision has been issued, it will be publicised and the public will be provided 20 days to lodge an appeal with the authorities. The timeframe within which to lodge the appeal will be communicated to the public.

9.4 Terms of Reference for Specialist Studies

The following Specialist Studies are proposed for the EIA Phase of the assessment:

- Agricultural Impact Assessment;
- Archaeological Impact Assessment;
- Aquatic Impact Assessment;
- Avifauna Impact Assessment;
- Bat Impact Assessment;
- Ecological Impact Assessment (flora and fauna);
- Heritage Screener;
- Heritage Impact Assessment;
- Noise Impact Assessment;
- Socio-economic Impact Assessment; and
- Visual Impact Assessment.

The Terms of Reference for the above-mentioned studies, outlining the information scope are provided below and the methodology for assessing the significance of impacts and alternatives is described in section 9.5. Specialists will also be required to address issues raised by I&APs in their reports.

Each specialist assessment will identify the relevant legislation and permits/ licences that could be applicable to the proposed project within the specified field of study. The specialists will liaise with relevant authorities if required. The impacts anticipated for construction, operation and decommissioning will be assessed based on the methodology described in Section 9.5 in order to determine the significance thereof pre-and post-mitigation. Comments provided by I&APs will also be considered and addressed if relevant to a specific study. Mitigation measures, if applicable, will be recommended for each phase of the project lifecycle for inclusion in the EMP. If the specialist has a preference for specific alternatives, it will be indicated as such.

9.4.1 Agriculture Impact Assessment

An Agricultural Impact Assessment will be undertaken based on the following Terms of Reference:

- The *status quo* will be investigated to determine the agricultural potential based on:
- The extent and quality of arable land (less than 12% slope) within the project area
 - The extent and quality of existing crops
 - The extent and quality of commercially unused land
 - The availability of irrigation water
 - The condition of the veld and other natural vegetation
 - Climate conditions
 - The percentage of usable land that will be utilised during construction
 - The percentage of usable land that will be utilised after construction.

Status Quo of soils will also be informed by any identified erosion hazards, current and previous land use, surface and ground water resources and the vegetation. Specifically, the following will be investigated:

- Compile a detailed desktop assessment for the proposed WEF and associated infrastructure;
- The soil assessment must include the following as per DEAs requirements:
 - Identification of the soil forms present on site;
 - The size of the area where a particular soil form is found;
 - GPS reading of soil survey points;
 - The depth of the soil at each survey point;
 - Soil colour;
 - Limiting factors;
 - Clay content; and
 - Slope of the site.
- Provide shape files containing the soil forms and relevant attribute data as depicted on the maps:
 - Undertake field verification which includes a soil survey. During this survey each soil sample point will be described to form and family level according to "Soil Classification
 - Combine the information in order to provide a spatial classification of the site based on its soil characteristics and associated agricultural potential.
 - Compile a detailed soil and land use impact assessment based on the predicted impacts.
- Investigate direct and indirect impacts as well as the effect of cumulative impacts.
- Detailed mitigation measures will be proposed in order to reduce the soil and land use impacts identified.
- The report will meet the Department of Agriculture's requirements.

9.4.2 Aquatic Impact Assessment

The assessment will include the following aspects related to potential wetlands and rivers for the site:

- A desktop assessment of the study area. This will cover the development footprint in relation to available information related to wetland / riverine ecosystems functioning, river classification, flow regime, water quality, physical, biota, and riparian habitat within the region.
- Identification of aquatic features and assessing impacts on, specifically, NFEPA features, important wetlands and rivers.
- A map demarcating the relevant local drainage area of the respective waterbodies, and the respective catchments within a 500m radius of the study area. This will demonstrate, from a holistic point of view the connectivity between the site and the surrounding regions, i.e. the zone of influence. Maps depicting demarcated waterbodies will be delineated to a scale of 1:10 000.
- The determination of the desktop ecological state of any aquatic systems, estimating their biodiversity, conservation and ecosystem function importance with regard ecosystem services. Note that this determination will not include avifaunal, herpetological or invertebrate studies; however possible habitat for species of special concern would be commented on.
- Recommend buffer zones and No-go areas around any delineated wetland areas based on the relevant legislation, e.g. Conservation Plan guidelines or best practice.
- Assess the potential impacts, based on the supplied methodology
- Provide mitigations regarding project related impacts, including engineering services that could negatively affect demarcated aquatic areas.
- Provide the relevant aspects with regard compiling the Environmental Management / Monitoring Plans.
- Supply geo-referenced GIS shape files of the aquatic areas.

- Explore the temporary infrastructure proposed to obtain and store water. Obtain the necessary approvals from the DWS in a separate procedure to the EIA process.

9.4.3 Avifauna Impact Assessment and Monitoring

Wind turbines could pose negative impacts on avifaunal species. An avifauna specialist study will be conducted. The assessment will include:

1. A desk-top review of existing literature to seek:
 - Previous means of predicting bird mortality (and other impacts) of wind turbines affecting birds in groups similar to those in the project area.
 - Accounts of mortality at wind turbines.
 - Information on the status of bird groups most likely to be affected.
2. A site visit to identify species of special concern and assess the likely impacts of the construction and operational phases on the avifauna of the site.
3. A 12-month bird monitoring programme has commenced and will continue to be conducted on the project area in line with the recommended bird monitoring guidelines.
4. Describe the affected environment and determine the status quo in terms of avifauna in South Africa;
5. Identify how an avifaunal resource or community will be affected by the proposed project;
6. Assess and evaluate the anticipated impacts using the provided methodology;
7. Discuss gaps in the baseline data with respect to avifauna and relevant habitats;
8. Map sensitive areas in and around the proposed project area(s); and
9. Make recommendations for relevant mitigation measures which will allow the reduction of negative impacts and the maximization of the benefits associated with any identified positive impacts.

A site specific, 12-month baseline monitoring regime was initiated in April 2015 in compliance with the bird guidelines. The findings of this monitoring campaign will be included in the EIA Reporting.

9.4.4 Bat Impact Assessment and Monitoring

A Bat Impact Assessment study will be conducted. This study will investigate the following issues:

1. The likelihood and significance of potential impacts on bat (Chiroptera) fauna, as a result of the proposed WEF;
2. Identification and mapping (where applicable) of any significant bat habitats;
3. Assessment of the sensitivity and significance of the site with regards to bat (Chiroptera) fauna;
4. Assessment of the significance of direct, indirect and cumulative impacts (including impacts on foraging, roost and migration patterns to a certain extent) of the proposed development and viable alternatives;
5. Identification of mitigatory measures to protect and maintain any bat habitats, reduce negative impacts and enhance positive impacts; and

A 12-month bat monitoring campaign was initiated during April 2015 in line with the best practice bat monitoring guidelines. The findings of this monitoring campaign will be included in the EIA Reporting.

9.4.5 Ecological Impact Assessment

An ecological impacts assessment study will be undertaken which will comprise a desktop study of all available relevant literature. The desktop study will be supplemented with a detailed survey of the site to determine the presence of species of special concern within the proposed project area. If any of these species are present within the project area, the EMP will include recommendations to manage impacts throughout the project lifecycle. The Terms of Reference for this specialist study is to:

1. Provide a description of the ecological (terrestrial fauna and flora) environment within and immediately surrounding the footprint of the proposed development. Fauna include mammals, reptiles, amphibians and avifauna. This aspect of the report will specifically include the identification of -
 - Areas of high, moderate and low sensitivity and suggest areas that should be avoided by construction activities.;
 - The presence of species of conservation concern, including endemic and protected species;
 - Habitat associations and conservation status of the identified fauna and flora;
 - Areas that have been or are vulnerable to invasion by invasive alien species; and
2. Include a brief description of relevant legislation, policies, guidelines and standards.
3. Verify whether the proposed project triggers any process or activity identified in terms of section 53(1) of NEM:BA.
4. Provide a desktop analysis that assesses the projects impact on sensitive areas, specifically NPAES focus areas, within any critically endangered or endangered ecosystems, within CBAs, ESAs or bioregional plans, or within sensitive areas identified in an applicable environmental management framework.
5. Undertake a physical survey of the study area to identify sensitive biodiversity habitats or species.
6. Describe and map different vegetation units and ecosystems found within the study area.
7. Provide a checklist of flora and fauna groups identified in the region to date, highlighting sensitive species and their possible areas of distribution.
8. Provide an assessment of the potential direct and indirect impacts resulting from the proposed development.
9. Assess potential cumulative impacts.
10. Based on the assessment, indicate preferred alternatives should there be a preference.
11. Provide a description of appropriate mitigation measures that can be adopted to reduce negative impacts for each phase of the project, and enhance positive impacts; and
12. Provide input into the environmental management plan,

9.4.6 Heritage Screener

The Heritage Screener summarises the Heritage Impact Assessments and Studies previously undertaken within the area of the proposed development and its surroundings. Heritage resources identified in these reports area assessed during the screening process. This approach includes:

1. Identifying heritage resources previously identified;
2. Describing heritage resources both in terms of type and significance;
3. Determining the extent of the inclusion zone to be taken into consideration;
4. Identify the paleontological sensitivity;
5. Determine the coverage rating ascribed to a report polygon according to the level of coverage; and
6. Provide a set of recommendations to the applicant based on whether an impact on heritage resources is anticipated.

9.4.7 Heritage and Archaeological Impact Assessment

As part of the Environmental Impact Assessment (EIA), it is necessary to undertake a phase one Heritage and Archaeological Study to fulfil SAHRA requirements in accordance with the National Heritage Resources Act (Act No 25 of 1999).

A Heritage and Archaeological Impact Assessment will therefore be conducted, the primary objective of which is to determine whether there are any indications that the proposed site is of archaeological significance. This will be a phase 1 assessment and will be largely desktop, although a site visit will be required to enable the specialist the opportunity to look for significant artefacts on the surface of the site, should this be necessary. It is not expected that a more detailed Phase 2 assessment will be required but this remains to be confirmed. The terms of reference for the Phase 1 Heritage and Archaeological Study will be to:

1. Determine the likelihood of heritage or archaeological remains of significance being present on the proposed site- verify with a site visit;
2. Identify and map (where applicable) the location of any significant heritage or archaeological remains and comment on the potential for the proposed project to impact these;
3. Assess the sensitivity and significance of heritage and archaeological remains in the site; and
4. Identify mitigatory measures to protect and maintain any valuable heritage or archaeological sites and remains that may exist within the proposed site.

9.4.8 Noise Impact Assessment

The Terms of Reference for Noise Impact Assessment will be to:

1. Identify all potential noise sensitive sites/ receptors that could be impacted upon by activities relating to the construction, operation and decommissioning of the proposed WEF.
2. Identify all noise sources relating to the activities of the facility during the construction and operational phases that could potentially result in a noise impact at the identified noise sensitive sites/ receptors.
3. Determine the existing ambient levels of noise at identified noise sensitive sites by conducting representative sound measurements.
4. Determine the sound emission, operating cycle and nature of the sound emission from each of the identified noise sources.
5. Calculate the combined sound power level due to the sound emissions of the individual noise sources.
6. Calculate the expected rating level of sound at the identified noise sensitive sites from the combined sound power level emanating from identified noise sources.
7. Determine the acceptable rating level for noise at the identified noise sensitive sites.
8. Display the rating level of sound emitted by the noise sources in the form of noise contours superimposed on the map of the project area.
9. Assess cumulative impacts.
10. Based on the assessment, indicate preferred alternatives should there be a preference.
11. Assess the noise impact at identified noise sensitive sites in terms of:-
 - a. The latest relevant SANS for "The measurement and rating of environmental noise with respect to land use, health, annoyance and to speech communication".
 - b. Noise Control Regulations.
 - c. World Health Organisation - Guidelines for Community Noise.
 - d. World Bank - Environmental Guidelines.
12. Investigate alternative noise mitigation procedures, if required, in collaboration with the design engineers of the facility and estimate the impact of noise upon implementation of such procedures.
13. Prepare noise mitigation procedures, if relevant.

9.4.9 Socio-economic Impact Assessment

The proposed approach to the Socio-Economic Impact Assessment (SIA) is based on the Guidelines for SIA endorsed by Western Cape Provincial Environmental Authorities (DEA&DP) in

2007²⁵. The Guidelines are based on accepted international best practice guidelines, including the Guidelines and Principles for Social Impact Assessment (Inter-organizational Committee on Guidelines and Principles for Social Impact Assessment, 1994) and IAIA Guidance for Assessing and Managing Social Impacts (2015). The approach to the study will involve:

- Project initiation and review of project information;
- Collection and review of reports and baseline socio-economic data on the area. This includes socio-economic characteristics of the affected areas, current and future land uses, and land uses planning documents relating to the study area and surrounds;
- Identification of the components associated with the construction and operational phase of the proposed project, including estimate of total capital expenditure, number of employment opportunities created, breakdown of the employment opportunities in terms of skill levels (low, medium and high skilled), breakdown of wages per skill level, assessment procurement policies etc.;
- Identify and set-up meetings with key stakeholders;
- Identify the zone of influence;
- Interviews with key affected parties, including local communities within the zone of influence, local landowners, key government officials (local and regional), non-government organizations, the client, local farmers associations, tourism and conservation officials, chamber of commerce etc.;
- Identification and assessment of key social issues and assessment of potential impacts (negative and positive) associated with the construction and operational phase of the proposed WEF. A key focus of the assessment will be an assessment of the potential socio-economic benefits for the local community associated with the proposed development;
- Identify impacts of proposed project on tourism within the project area and the surrounding areas;
- Identification of appropriate measures to avoid, mitigate, enhance and compensate for potential social and economic impacts; and
- Identify cumulative impacts and mitigation measures.

9.4.10 Visual and Landscape Impact Assessment

The height of the wind turbines are guided by the wind resource. In order to capture optimal wind energy, the hub height of the wind turbines are proposed to be approximately 120m above the natural ridge level. Due to the height of these structures, the turbines could potentially be visible for vast distances which could impact on the existing landscape features. Therefore, the Visual and Landscape Impact Assessment (the details of which are provided below) will assess the potential impacts and identify mitigation measures to enhance positive impacts and reduce negative impacts. The specific Terms of Reference for the Visual and Landscape Impact Assessment are to:

1. Identify impacts related to visual, aesthetic and scenic resources.
2. Conduct a site reconnaissance visit and photographic survey of the proposed project area and potential receptors and viewpoints.
3. Conduct a mapping exercise to establish visual sensitivity of these receptors and viewpoints to:
 - Describe and rate the scenic character and sense of place of the area and site.
 - Establish extent of visibility by mapping the view-sheds and zones of visual influence.
 - Establish visual exposure to viewpoints.
 - Establish the inherent visual sensitivity of the site by mapping slope grades, landforms, vegetation, special features and land use and overlaying all relevant above map layers to assimilate a visual sensitivity map.

²⁵ Accessible from <http://eadp.westerncape.gov.za/your-resource-library/policies-guidelines?page=1>

4. Review relevant legislation, policies, guidelines and standards that will guide the visual impact assessment.
5. Prepare a visual impact assessment report:
 - Assessing visual sensitivity criteria associated with the various alternatives such as extent of visibility, the sites inherent sensitivity, visual sensitivity of the receptor's, visual absorption capacity of the area and visual intrusion on the character of the area.
 - Identify visual impacts of proposed project on tourism within the project area and the surrounding areas;
 - Prepare photomontages of the proposed development.
 - Conduct shadow flickering modelling.
 - Assess the proposed project against the visual impact criteria (visibility, visual exposure, sensitivity of site and receptor, visual absorption capacity and visual intrusion) for the site. Coordinates provided by Mr Warren Petterson for three locations potentially sensitive to visual impact will be assessed.
 - Assess impacts based on the methodology described in Section 9.6 (including the nature of impact, extent, duration, intensity and probability to determine the significance).
 - Assess cumulative impacts.
 - Based on the assessment, indicate preferred alternatives should there be a preference.
 - Establish mitigation measures/recommendations to be implemented during the project lifecycle with regards to minimizing visual risk areas and to enhance positive impacts.
6. Liaise with authorities, if necessary.

9.5 Methodology for Assessing the Duration and Significance of Impacts

Although specialists will be given relatively free rein on how they conduct their research and obtain information, they will be required to provide their reports to the EAP in a specific layout and structure, so that a uniform specialist report volume can be produced.

To ensure a direct comparison between various specialist studies, a standard rating scale has been defined and will be used to assess and quantify the identified impacts. This is necessary since impacts have a number of parameters that need to be assessed. Four factors need to be considered when assessing the significance of impacts, namely:

1. Relationship of the impact to **temporal** scales - the temporal scale defines the significance of the impact at various time scales, as an indication of the duration of the impact.
2. Relationship of the impact to **spatial** scales - the spatial scale defines the physical extent of the impact.
3. The severity of the impact - the **severity/beneficial** scale is used in order to scientifically evaluate how severe negative impacts would be, or how beneficial positive impacts would be on a particular affected system (for ecological impacts) or a particular affected party. The severity of impacts can be evaluated with and without mitigation in order to demonstrate how serious the impact is when nothing is done about it. The word 'mitigation' means not just 'compensation', but also the ideas of containment and remedy. For beneficial impacts, optimization means anything that can enhance the benefits. However, mitigation or optimization must be practical, technically feasible and economically viable.
4. The **likelihood** of the impact occurring - the likelihood of impacts taking place as a result of project actions differs between potential impacts. There is no doubt that some impacts would occur (e.g. loss of vegetation), but other impacts are not as likely to occur (e.g. vehicle accident), and may or may not result from the proposed development. Although some impacts may have a severe effect, the likelihood of them occurring may affect their overall significance.

Each criterion is ranked with scores assigned as presented in Table 9-3 to determine the overall **significance** of an activity. The criterion is then considered in two categories, viz. effect of the activity and the likelihood of the impact. The total scores recorded for the effect and likelihood are then read off the matrix presented in Table 9-4, to determine the overall significance of the impact (Table 9-5). The overall significance is either negative or positive.

The **environmental significance** scale is an attempt to evaluate the importance of a particular impact. This evaluation needs to be undertaken in the relevant context, as an impact can either be ecological or social, or both. The evaluation of the significance of an impact relies heavily on the values of the person making the judgment. For this reason, impacts of especially a social nature need to reflect the values of the affected society.

Negative impacts that are ranked as being of “**VERY HIGH**” and “**HIGH**” significance will be investigated further to determine how the impact can be minimised or what alternative activities or mitigation measures can be implemented. These impacts may also assist decision makers i.e. lots of **HIGH** negative impacts may bring about a negative decision.

For impacts identified as having a negative impact of “**MODERATE**” significance, it is standard practice to investigate alternate activities and/or mitigation measures. The most effective and practical mitigations measures will then be proposed.

For impacts ranked as “**LOW**” significance, no investigations or alternatives will be considered. Possible management measures will be investigated to ensure that the impacts remain of low significance.

Table 9-3: Criterion used to rate the significance of an impact.

		Temporal scale	Score	
EFFECT	Short term	Less than 5 years	1	
	Medium term	Between 5 and 20 years	2	
	Long term	Between 20 and 40 years (a generation) and from a human perspective almost permanent.	3	
	Permanent	Over 40 years and resulting in a permanent and lasting change that will always be there	4	
	Spatial Scale			
	Localised	At localised scale and a few hectares in extent	1	
	Project area	The proposed site and its immediate environs	2	
	Regional	District and Provincial level	3	
	National	Country	3	
	International	Internationally	4	
	Severity		Benefit	
	Slight / Slightly Beneficial	Slight impacts on the affected system(s) or party (ies)	Slightly beneficial to the affected system(s) or party (ies)	1
	Moderate / Moderately Beneficial	Moderate impacts on the affected system(s) or party(ies)	An impact of real benefit to the affected system(s) or party (ies)	2
	Severe / Beneficial	Severe impacts on the affected system(s) or party (ies)	A substantial benefit to the affected system(s) or party (ies)	4
Very Severe / Very Beneficial	Very severe change to the affected system(s) or party(ies)	A very substantial benefit to the affected system(s) or party (ies)	8	
LIKELIHOOD	Likelihood			
	Unlikely	The likelihood of these impacts occurring is slight	1	
	May Occur	The likelihood of these impacts occurring is possible	2	
	Probable	The likelihood of these impacts occurring is probable	3	
	Definite	The likelihood is that this impact will definitely occur	4	

Table 9-4: The matrix that will be used for the impacts and their likelihood of occurrence

LIKELIHOOD	Effect														
	3	4	5	6	7	8	9	10	11	12	13	14	15	16	
1	4	5	6	7	8	9	10	11	12	13	14	15	16	17	
2	5	6	7	8	9	10	11	12	13	14	15	16	17	18	
3	6	7	8	9	10	11	12	13	14	15	16	17	18	19	
4	7	8	9	10	11	12	13	14	15	16	17	18	19	20	

Table 9-5: The significance rating scale

Significance	Description	Score
Low	Acceptable impact for which mitigation is desirable but not essential. The impact by itself is insufficient even in combination with other low impacts to prevent the development being approved. These impacts will result in either positive or negative medium to short term effects on the social and/or natural environment.	4-7
Moderate	An important impact which requires mitigation. The impact is insufficient by itself to prevent the implementation of the project but which in conjunction with other impacts may prevent its implementation. These impacts will usually result in either a positive or negative medium to long-term effect on the social and/or natural environment.	8-11
High	A serious impact, if not mitigated, may prevent the implementation of the project (if it is a negative impact). These impacts would be considered by society as constituting a major and usually a long-term change to the (natural &/or social) environment and result in severe effects or beneficial effects.	12-15
Very High	A very serious impact which, if negative, may be sufficient by itself to prevent implementation of the project. The impact may result in permanent change. Very often these impacts are un-mitigable and usually result in very severe effects, or very beneficial effects.	16-20

9.6 Cumulative Impacts

Project induced cumulative impacts should be considered, along with direct and indirect impacts, in order to better inform the developer’s decision making and project development process. The International Finance Corporation (IFC) Performance Standards (PS) (2012) defines cumulative impacts as those “*that result from the incremental impact, on areas or resources used or directly impacted by the project, from other existing, planned or reasonably defined developments at the time the risks and impacts identification process is conducted.*” Cumulative impacts result from incremental changes caused by other past, present or reasonably foreseeable actions acting in concert with the project. Individually minor impacts from different developments can interact in various ways over time to become collectively significant. Barbour (2007: 39), adapting work by Cooper, 2004, describes cumulative impacts as impacts which “may be:

- **Additive:** the simple sum of all the effects (e.g. the accumulation of ground water pollution from various developments over time leading to a decrease in the economic potential of the resource);
- **Synergistic:** effects interact to produce a total effect greater than the sum of individual effects. These effects often happen as habitats or resources approach capacity (e.g. the accumulation of water, air and land degradation over time leading to a decrease in the economic potential of an area);
- **Time crowding:** frequent, repetitive impacts on a particular resource at the same time (e.g. multiple boreholes decreasing the value of water resources);
- **Neutralizing:** where effects may counteract each other to reduce the overall effect (e.g. infilling of a wetland for road construction, and creation of new wetlands for water

treatment); and,

- **Space crowding:** high spatial density of impacts on an ecosystem (e.g. rapid informal residential settlement).”

Cumulative impacts are, however, difficult to accurately and confidently assess, owing to the high degree of uncertainty, as well as it often being based on assumptions. It is therefore difficult to provide as detailed an assessment of cumulative impacts as is the case for direct and indirect project induced impacts. This is usually because of the absence of specific details and information related to cumulative impacts. In these situations, the EAP will need to ensure that any assumptions made as part of the assessment are made clear. Accordingly, the EIA will include an overview and analysis of cumulative impacts related to a variety of project actions, and does not provide a significance rating for these impacts, as was done for direct project induced impacts. The objective is to identify and focus on potentially significant cumulative impacts so these may be taken into consideration in the decision-making process. It is important to realise these constraints, and to recognise that the assessment will not, and indeed cannot, be perfect. The potential for cumulative impacts will, however, be considered, rather than omitted from the decision making-process and is therefore of value to the project and the environment.

The following assumptions will guide the cumulative assessments:

- All projects within a 30km radius will be considered.
- It is assumed that all projects proposed (both energy generation and electrical infrastructure projects) will be implemented as a worst case scenario.

Other wind and solar renewable energy projects surrounding the project area are shown in Figure 9.1 below.

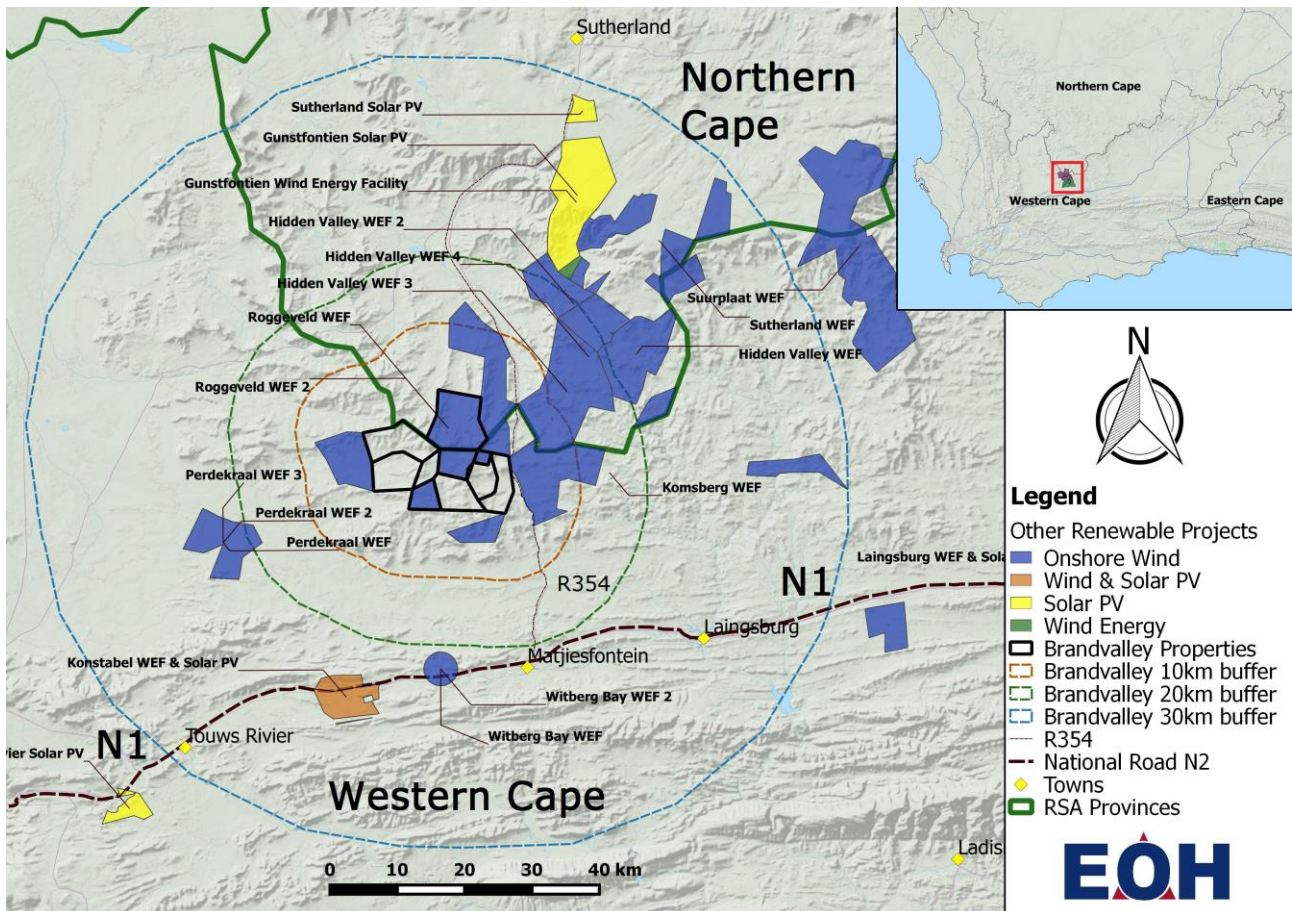


Figure 9.1: The proposed Brandvalley WEF project site in relation to other renewable energy projects (solar and wind).

9.7 Stages at which the Competent Authority will be Consulted

A meeting was held with the DEA on 14 July 2015. The DEA has been further consulted prior to the commencement of the EIA process to verify the requirements as set out in the EIA Regulations promulgated in 2014. Consultation with DEA will be on-going throughout this EIA. However, it is anticipated that DEA will provide relevant comment with respect to PoS for the EIA, as it informs the content of the EIR.

- Draft Scoping and EIA Reports will be submitted to DEA for commenting.
- The Final Scoping Report were submitted on 2 March 2016 for decision making on the PoS EIA.
- The Final EIA Report will be submitted during July 2016 for final decision making.
- It is anticipated that the DEA would prefer to undertake a site visit prior to final decision making which is scheduled for October 2016.

9.8 The Public Participation Process (PPP)

The primary aims for the PPP include the following:

- meaningful and timeous communication with I&APs;
- promoting transparency and an understanding of the proposed project and its potential environmental (social and biophysical) impacts;
- accountability for information used for decision-making;
- serving as a structure for liaison and communication with I&APs;
- assisting in identifying potential environmental (socio-economic and biophysical) impacts associated with the proposed development; and
- inclusivity (the needs, interests and values of I&APs that must be considered in the decision-making process).

Table 9-6: Summary of the Public Participation Process undertaken in the Scoping and EIA Phase.

Date	Phase	Meeting and/or deliverable	Objective
14 July 2015	Pre-Assessment	Meeting with the DEA	A pre-application meeting was held with the applicant, environmental consultant and DEA to determine and clarify the appropriate way forward to conduct the Environmental Impact Assessment for the proposed Brandvalley and Rietkloof Wind Energy Facilities (WEF).
30 July – 27 August 2015		Distribute pre-assessment notifications as stipulated in the Sections outlined above	To inform all I&APs of the proposed project and to comply with Section 41 of the EIA Regulations.
14 – 18 December 2015		Compile Comments and Response Table	As per legal requirements all issues and/or comments raised by registered interested and affected parties needs to be documented in writing and responded to by the EAP.
25 January 2016- 23 February 2016 (extended until 29 February 2016)	Scoping Phase	Distribute notifications of the availability of the Draft Scoping Report (DSR) for public review as stipulated in the Sections outlined above	To inform I&APs of release of DSR and to comply with Section 40 of the EIA Regulations.
11 February 2016		Open House/Public Meeting	In order to inform all I&APs of the outcome of the Scoping Report.
3 March 2016		Comments received on the Draft Scoping Report will be compiled into a Comments and Response Table. This Comments and Responses Table will be circulated to all parties who provide comments and will be included to the Final Scoping Report for submission	As per legal requirements all issues and/or comments raised by registered interested and affected parties needs to be documented in writing and responded to by the EAP. Decision making by the DEA on the acceptability of the plan of study for EIA.

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Date	Phase	Meeting and/or deliverable	Objective
23 May 2016 – 22 June 2016	EIA Phase Notification of the decision	to DEA.	
02 June 2016		Distribute notifications of the availability of the Draft EIR for public review as stipulated in the Sections outlined above	To inform I&APs of release of DEIR and to comply with Section 40 of the EIA Regulations.
23 May 2016 - 13 July 2016		Hold open house event	In order to ensure that all I&APs have the opportunity to provide input to the proposed project and have their concerns addressed.
01 November 2016		Compile Comments and Response Table for incorporation into the Final EIR and circulation to all parties who submitted comments.	As per legal requirements all issues and/or comments raised by registered interested and affected parties needs to be documented in writing and responded to by the EAP
		All registered interested and affected parties will be notified of the decision taken by the DEA to either reject the project or issue an environmental authorisation. Notification will be done through written notification. The wider public will be informed of the decision through advertisements.	Inform all interested parties of the DEA's decision in accordance with Section 4 (2) of the 2014 EIA Regulations.

10. CONCLUSION

This Scoping Report has documented the procedure for determining the extent of, and approach to, the Environmental Impact Assessment (EIA) Phase and involved the following key tasks:

- Involvement of relevant authorities and Interested and Affected Parties (I&APs) through the Public Participation Process (PPP);
- Identification and selection of feasible alternatives to be assessed during the EIA Phase;
- Identification of potential issues and or impacts associated with each alternative to be assessed during the EIA Phase; and
- Finalising Terms of Reference (ToR) for any specialist studies required to inform the EIA Phase (Plan of Study (PoS) for the Environmental Impact Report (EIR)).

10.1 Activity and Possible Impacts

Brandvalley Wind Farm (Pty) Ltd proposes the development of a 140 MW Wind Energy Facility (WEF) on the border between the Northern Cape and Western Cape Provinces. The nature of the proposed site for the establishment of the WEF is suitably-placed on agricultural land which is currently used predominantly for livestock grazing. However, the establishment of the proposed WEF could result in various potential issues pertaining to:

- Visual intrusion on the landscape.
- Noise impacts on surrounding land inhabitants.
- Ecological sensitivity (flora, fauna and aquatic).
- Agricultural potential and utilisation.
- Avifaunal and bat sensitivity.
- Heritage resources.
- Socio-economic impacts and benefits.

These key issues are to be comprehensively addressed and assessed according to the ToR developed for each specialist during the EIA Phase.

10.2 Recommendation

The Final Scoping Report are in compliance with the 2014 EIA Regulations. At this stage, no fatal flaws have been identified through the public consultation and the initial assessments of the area and it is therefore recommended that the proposed development proceed to EIA Phase for further assessment.

10.3 The Way Forward

In accordance with Section 22 of the Government Notice (GN) R.982, the DEA must, within 43 days of receipt of this Final Scoping Report –

- (a) accept the report, with or without conditions, and advise the applicant to proceed or continue with the tasks contemplated in the PoS for EIA; or
- (b) reject the report if -
 - (i) the proposed activity is in conflict with a prohibition contained in legislation; or
 - (ii) if the Scoping Report does not substantially comply with Appendix 2 of these Regulations and the applicant is unwilling or unable to ensure compliance with these requirements within the prescribed timeframe,

If DEA accept the PoS for EIA, this process can proceed to the EIA phase in accordance with the PoS.

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