

Already on Sahra

25th November 2009



our future through science

Attention: Ms Thanduxolo Lungile

SAHRA: Provincial Authority
P O Box 759
East London
5200

Tel: 043 - 722 1740

P O Box 320
Stellenbosch
7599
South Africa

Tel: +27 21 888 2400
Fax: +27 12 888 2693

www.csir.co.za

Dear Ms Lungile,

BASIC ASSESSMENT FOR THE PROPOSED WIND MEASURING MAST AND WIND TEST TURBINE IN THE COEGA IDZ NEAR PORT ELIZABETH
(Dept of Environmental Affairs EIA reference: 12/12/20/1680)

FINAL BASIC ASSESSMENT REPORT FOR DECISION-MAKING

Electrawinds, an international renewable energy company with its head office in Belgium, is proposing to establish a wind measuring mast and single wind turbine in the Coega IDZ, near Port Elizabeth. Electrawinds has appointed the CSIR as the independent Environmental Assessment Practitioner to conduct a Basic Assessment process in terms of the National Environmental Management Act (Act 107 of 1998) and its Regulations 385 and 386 (Government Gazette No. 28753 of 21 April 2006).

A Notice of Intent dated 17th September 2009 was submitted by CSIR to the national Department of Environmental Affairs and other relevant organs of state. Relevant organs of state were placed on the I&AP register for the BA process at the outset. Thereafter, the Draft Basic Assessment Report (dated 6th October 2009) was released for a 40 day stakeholder review period. Comments were submitted by 18th November 2009 and are incorporated into the final report.

The **final BA Report** is attached and has been submitted to national DWEA for decision-making. The report has been placed on the project website (www.publicprocess.co.za) and the following authorities have been provided with a copy of the final BA Report:

Title	First Name	Last Name	Organisation	Town	Telephone
Mr	Jeff	Govender	DEDEA	Greenacres, PE	041 - 508 5811
Ms	Lené	Grobbelaar	DWEA	Pretoria	012 - 310 3087
Mr	Luvuyo	Mkontwana	CDC	Port Elizabeth	041 - 403 0590
Ms	Primrose	Madikizela	Transnet NPA	Port Elizabeth	041 - 507 1951/1847
Ms	Thanduxolo	Lungile	SAHRA	East London	043 - 722 1740
Ms	Jill	Manuel	NMBM	Port Elizabeth	041 - 506 5630
Ms	Lizell	Stroh	Civil Aviation Authority	Halfway House	083 540 8200
Mr	Marius	Keyser	EC Dept of Roads and Transport	Algoa Park	041 - 452 2073

Yours sincerely,

Paul Lochner
CSIR Project Leader
Certified Environmental Assessment Practitioner – SA

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Basic Assessment Report

FOR A PROPOSED WIND MEASURING MAST AND WIND
TURBINE IN THE COEGA INDUSTRIAL DEVELOPMENT
ZONE, NEAR PORT ELIZABETH

FINAL REPORT



DEAT EIA REFERENCE NUMBER:
12/12/20/1680

CSIR REPORT No.:

SA HERITAGE RESOURCES AGENCY
RECEIVED

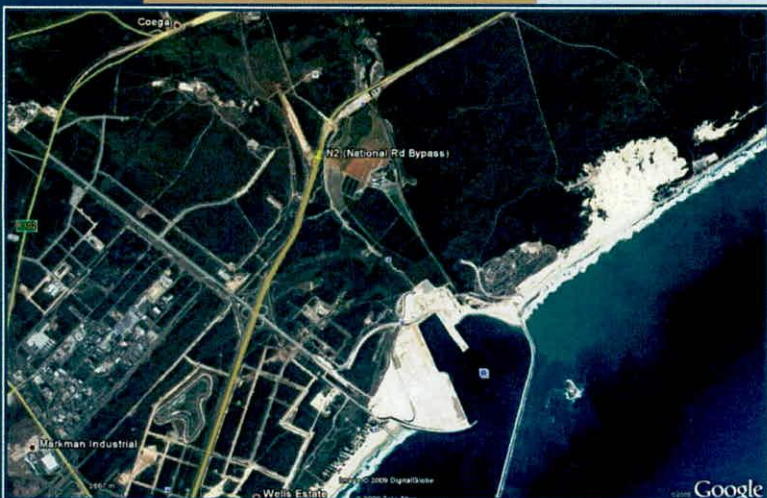
18 MAY 2010

PREPARED BY:
CSIR
P O Box 320
STELLENBOSCH
7599
SOUTH AFRICA

AUTHORS:
PAUL LOCHNER
CHRISTABEL GELAND
HENRY HOLLAND
SANDY WREN

PREPARED FOR:
ELECTRAWINDS

24 NOVEMBER 2009



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When used as a reference, this report should be cited as:

CSIR, 2009. Basic Assessment Report for the proposed wind measuring mast and wind turbine in the Coega Industrial Development Zone, near Port Elizabeth: Final Report, CSIR Report No. CSIR/CAS/EMS/ER/2009/0027/B. Stellenbosch.



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SUMMARY

Electrawinds NV, a Belgium-based company, intend to invest in wind energy in the Coega Industrial Development Zone (IDZ), near Port Elizabeth. They are proposing to implement their project in two phases, the first of which comprises the establishment of a 60 m wind measuring mast and a single 2.3 megawatt (MW) wind turbine. The monitoring mast would be operational for 12 months and the data collected would inform further planning and investment decisions. The wind turbine is expected to be operational for at least 20 years. Both the mast and turbine are included in this Basic Assessment.

The main positive and negative impacts are summarised below:

Sourcing of wind data and promotion of wind energy

Although the actual generation capacity of the single turbine is small (2.3 MW), it will demonstrate tangible progress towards the development of renewable energy sources for the Nelson Mandela Bay Municipality (NMBM). The project could showcase the NMBM as a leader in renewable energy, for example, during the 2010 FIFA World Cup. The effect of the project in promoting the use of wind energy is predicted to have a positive impact of low significance.

Visual impact and effect on "sense of place"

The wind turbine will be 100 m tall (from ground to hub height) with three blades each 50 m long. Given its location on the coastal plateau of the Coega IDZ, it will be visible from within the IDZ and immediate surrounds. It will therefore have an effect on the sense of place of the area. The turbine site is in the midst of the IDZ. As the IDZ develops around the turbine, the turbine will have less effect on the sense of place. Other prominent features near the turbine site, such as the Eskom Dedisa 400 kV substation and several high capacity power lines that cross the IDZ nearby, already give the area an industrial character. It is recognised that the visual impact of a wind turbine is a subjective matter. Given the location of the turbine within an industrial zone, and that it indicates progress towards using renewable energy in South Africa, the visual impact is predicted to be positive and of medium significance.

Impact of vegetation clearing and habitat loss

The project requires clearing of an area of approximately 2000 m² for permanent features such as foundations, roads and hard standing areas for cranes. This impact would be for the duration of the project (20 years). In addition, for the wind monitoring mast an area of approximately 1600 m² needs to have vegetation trimmed to a height of 10 cm above ground in order to lay out the mast and stays prior to erection. Prior to construction, any species of special concern should be collected and placed in a nursery. Given the above factors and the context of the project within an IDZ, the negative impact of the project on habitat loss is of low significance.

Impacts on birds

The risk of birds colliding with the turbines or the stays of the wind monitoring mast was assessed. Typically the species most at risk of collision are the larger less agile birds such as cranes and bustards, as well as raptors that use updrafts for slope soaring. Given that the habitat at Coega is not associated with cranes and bustards; that the larger birds tend to avoid turbines; and that the monitoring mast is erected for a 12 month period, the negative impact of the project on birds is predicted to be of low significance. It is recommended that monitoring be conducted of bird and bat impacts for the first 12 months of the project to verify this prediction.

Concluding statement

Provided that the recommended management actions are implemented effectively, the proposed Electrawinds wind monitoring mast and single turbine are assessed to provide a net positive contribution to sustainability.



environment & tourism

Department:
Environmental Affairs and Tourism
REPUBLIC OF SOUTH AFRICA

(For official use only)

File Reference Number:

Application Number:

Date Received:

Basic Assessment Report in terms of the National Environmental Management Act, 1998 (Act No. 107 of 1998), as amended, and the Environmental Impact Assessment Regulations, 2006

Kindly note that:

1. This **basic assessment report** is a standard report that may be required by a competent authority in terms of the EIA Regulations, 2006 and is meant to streamline applications. Please make sure that it is the report used by the particular competent authority for the activity that is being applied for.
2. The report must be typed within the spaces provided in the form. The size of the spaces provided is not necessarily indicative of the amount of information to be provided. The report is in the form of a table that can extend itself as each space is filled with typing.
3. Where applicable **tick** the boxes that are applicable or **black out** the boxes that are not applicable in the report.
4. An incomplete report may be returned to the applicant for revision.
5. The use of "not applicable" in the report must be done with circumspection because if it is used in respect of material information that is required by the competent authority for assessing the application, it may result in the rejection of the application as provided for in the regulations.
6. This report must be handed in at offices of the relevant competent authority as determined by each authority.
7. No faxed or e-mailed reports will be accepted.
8. The report must be compiled by an independent environmental assessment practitioner.
9. Unless protected by law, all information in the report will become public information on receipt by the competent authority. Any interested and affected party should be provided with the information contained in this report on request, during any stage of the application process.
10. A competent authority may require that for specified types of activities in defined situations only parts of this report need to be completed. In addition, if it is clear to the EAP that because of the particular circumstances of the case it is not sensible to complete any of the sections indicated under paragraph 3 of this report, he or she may apply for exemption from completing that part of the report in the spaces provided in the report. It must however be noted that if the application for exemption is turned down, the report may have to be resubmitted.

SECTION A: APPLICATION FOR EXEMPTION

The relevant parts of this section must be completed if the environmental assessment practitioner (EAP) on behalf of the applicant wishes to apply for exemption from completing or complying with certain parts of this basic assessment report.

1. APPLICATION FOR EXEMPTION FROM ASSESSING ALTERNATIVES:

At least two alternatives (site or activity) should be assessed. If that is not possible, the applicant should apply for exemption from having to assess alternatives. Such exemption will, however, not apply to the no-go alternative that must be assessed in all cases.

Provide a detailed motivation for not considering alternatives including an explanation of the reason for the application for exemption (supporting documents, if any, should be attached to this report):

I declare that the above motivation is accurate and, hereby apply for exemption in terms of regulation 51 of the Environmental Impact Assessment Regulations, 2006, from having to assess alternatives in this application as required in section 24(4)(b) in the National Environmental Management Act, 1998 (Act No. 107 of 1998)

Signature of the EAP: _____ Date: _____

2. APPLICATION FOR EXEMPTION FROM COMPLYING WITH PARTS OF REGULATION 23(2) REGARDING THE CONTENT OF THIS BASIC ASSESSMENT REPORT:

Application for exemption from certain parts of regulation 23(2) regarding the completion of certain parts of this basic assessment report may be made by completing the relevant sections below.

Indicate the numbers of the sections of this report for which exemption is applied for:

Section B:	7(a)	7(b)	7(c)	7(d)	8	9	10(c)	10(e)	10(f)	10(g)	10(h)	10(j)	10(k)	12
Section C:	1	2	3	4	5	6								
Section D:	1(a)	1(b)	1(c)	1(d)	1(f)	1(g)	3							

Provide a detailed motivation including an explanation of the reason for the application for exemption (supporting documents, if any, should be attached to this report):

I declare that the above motivation is accurate and, hereby apply for exemption in terms of regulation 51 of the EIA Regulations, 2006, from having to complete the indicated sections of the Basic Assessment Report.

Signature of the EAP: _____ Date: _____

SECTION B: ACTIVITY INFORMATION

1. ACTIVITY DESCRIPTION

Describe the activity, which is being applied for in detail (A1):

Electrawinds NV, a Belgium-based company, has announced their intent to invest in wind energy in the Coega Industrial Development Zone (IDZ), near Port Elizabeth. They are proposing to implement their project in two phases, the first of which comprises the establishment of a wind measuring mast and a 'test' wind turbine. The proposed site is in Zone 9 of the IDZ, which is earmarked for metallurgical industrial activities. The site was provided by the Coega Development Corporation (refer to letter in Appendix G from Alan Zeiss of CDC dated 30 June 2009).

To guide further investment decisions and to gather the necessary site specific wind data, Electrawinds would like to establish a wind monitoring mast to collect wind data for a period of 12 months. This mast will be approximately 62 m in height with securing stays on four sides extending approximately 50 m from the base. The mast has anemometers at heights of 40 m, 50 m and 62 m. When the 12 month monitoring period is complete the mast can be dismantled and re-used elsewhere.

Electrawinds also proposes to establish a 'test' turbine with the capacity to generate approximately 2.3 MW of electricity. It is envisioned that the electricity generated by this turbine will initially feed in to the electricity requirements of the Port Elizabeth football stadium, with power being available in time for the FIFA 2010 world cup matches in PE; and later into either the Nelson Mandela Bay Metropolitan Municipality (NMBM) power supply network or the ESKOM grid for general use. It is expected that this turbine will be operational for at least 20 years, with the potential for an extended lifespan beyond 20 years depending on technology developments and maintenance requirements.

Both the mast and turbine are included in this Basic Assessment.

2. ALTERNATIVES

Describe alternatives that are considered in this application. Alternatives should include a consideration of all possible means by which the purpose and need of the proposed activity could be accomplished in the specific instance taking account of the interest of the applicant in the activity. 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 site or activity (including different processes etc.) or both is appropriate needs to be informed by the specific circumstances of the activity and its environment. After receipt of this report the competent authority may also request the applicant to assess additional alternatives that could possibly accomplish the purpose and need of the proposed activity if it is clear that realistic alternatives have not been considered to a reasonable extent.

2(a) Site alternatives:

Describe site alternative 1 (S1), for the activity described above, or for any other activity alternative:

The site in Zone 9 of the Coega IDZ was selected following initial discussions and screening of sites, between the CDC and Electrawinds (refer to letter from CDC dated 30th June 2009 in Appendix G). For this reason no other sites have been further investigated for suitability by CDC or Electrawinds. Selection was based on the following criteria:

- Located on the higher lying areas of the IDZ for optimal wind conditions;
- Close proximity to the 400 kV Dedisa substation (approx 500m);
- Close to the grid connection for the NMBM, i.e. the 11 kV and 132 kV lines;
- Easy access from existing tarred road (R102) and existing gravel road leading to the quarry, leads to the south-east of the site;
- Site is situated outside the demarcated IDZ Open Space;
- Site is 26 km from the PE airport and in an acceptable zone in terms of the aviation requirements and restrictions (refer to map in Appendix A);
- This site is > 100 m from the existing quarry (therefore DME do not have to be consulted).

Describe site alternative 2 (S2), if any, for the activity described above, or for any other activity alternative:

Describe site alternative 3 (S3), if any, for the activity described above, or for any other activity alternative:

(2)(b) Activity alternatives:

Describe activity alternative 2 (A2), if any, for any or all of the site alternatives as appropriate:

Wind measuring mast alternatives:

Electrawinds considered mast alternatives ranging from 50 – 70 m height. The 60 m height was considered adequate to obtain the required data and to satisfy the requirements of international financial agencies who may invest in the project. The monitoring results from this mast will be used to correlate data on site with other surface level wind measurements and other wind data in the PE area (for example the mast at Driftsands, west of PE).

Describe activity alternative 2 (A2), if any, for any or all of the site alternatives as appropriate:

Wind turbine alternatives:

- (i) **Generation Capacity**
Electrawinds considered turbine generation capacities ranging from 2 – 2.5 MW. The 2.3 MW was selected as the suitable option.
- (ii) **Tower Height**
Electrawinds considered heights of 80 – 100 m. The 100 m height was selected for maximum wind potential. This is within the limit of cranes currently available in South Africa.
- (iii) **Technology Providers and Turbines**
Electrawinds considered three technology providers, i.e. Siemens, Enercon and Vestas. The Siemens SWT-2.3-101, the Enercon E82 and the Vestas V80 turbines were considered. Siemens was selected as a possible choice of turbine as they have been in South Africa for over 100 years and have been the main supplier to Eskom. They therefore have strong local support.

Describe activity alternative 2 (A2), if any, for any or all of the site alternatives as appropriate:

Grid connection alternatives:

- (i) Electrawinds investigated the options of connecting to the grid via ESKOM or the NMBM. The NMBM was selected. The small scale of the project allows connection to the NMBM grid. This option also provides more direct supply into the Metro in time for the FIFA World Cup.
- (ii) For the connection from the turbine to the grid, options for an above or below ground cable connection were evaluated. Electrawinds opted for a combination of below ground connection (on flat ground alongside roads) and above ground (where the power line crosses a gully which forms part of the Coega Open Space System).

Describe activity alternative 2 (A2), if any, for any or all of the site alternatives as appropriate:

Project phasing alternatives:

Electrawinds deliberated on whether to conduct the whole project (i.e. wind farm in the Coega IDZ with generation capacity of approximately 57.5 MW) in one or two phases. A two phased approach was selected, in order to collect information in Phase 1 (i.e. the project covered in this BA, the 2.3 MW turbine and wind measuring mast) which will then guide the planning and design for a potential Phase 2.

4. ACTIVITY POSITION

Indicate the position of the activity using the latitude and longitude of the centre point of the site for each alternative site. The co-ordinates should be in degrees and decimal minutes. The minutes should have at least three decimals to ensure adequate accuracy. The projection that must be used in all cases is the WGS84 spheroid in a national or local projection.

Alternative:

Alternative S1¹ (preferred or only site alternative)
Coordinates (in WGS 84) for the mid-point of the wind turbine site.
Coordinates (in WGS 84) for the mid-point of the wind mast monitoring site.

Alternative S2 (if any)
 Alternative S3 (if any)

Latitude (S):		Longitude (E):	
33°	45.157'	25°	40.597'
33°	45.714'	25°	41.074'
°	'	°	'
°	'	°	'

¹ "Alternative S.." refer to site alternatives.

Note from CSIR: Coordinates of specific components of the project are provided in the layout plans in Appendix A (Section F). The micro-siting of the turbine and wind mast may result in a minor adjustment in these coordinates, but this will not change the predicted impact significance ratings, provided that the physical project footprint remains outside of the Coega Open Space Plan.

In the case of linear activities:

Alternative:

Alternative S1 (preferred or only route alternative)

- Starting point of the activity
- Middle point of the activity
- End point of the activity

Latitude (S):

Longitude (E):

o	+	o	+
o	+	o	+
o	+	o	+

Alternative S2 (if any)

- Starting point of the activity
- Middle point of the activity
- End point of the activity

o	+	o	+
o	+	o	+
o	+	o	+

Alternative S3 (if any)

- Starting point of the activity
- Middle point of the activity
- End point of the activity

o	+	o	+
o	+	o	+
o	+	o	+

For route alternatives that are longer than 500m, please provide an addendum with co-ordinates taken every 250 meters along the route for each alternative alignment.

5. PHYSICAL SIZE OF THE ACTIVITY

Indicate the physical size of the preferred activity/technology as well as alternative activities/technologies (footprints):

Alternative:

Alternative A1² (preferred activity alternative)

Size of the activity:

Physical project footprint (including the access road) is approximately 2000 m ²
m ²
m ²

Alternative A2 (if any)

Alternative A3 (if any)

or, for linear activities:

Alternative:

Alternative A1 (preferred activity alternative)

Alternative A2 (if any)

Alternative A3 (if any)

Length of the activity:

m
m
m

Indicate the size of the alternative sites or servitudes (within which the above footprints will occur):

Alternative:

Alternative A1 (preferred activity alternative)

Alternative A2 (if any)

Alternative A3 (if any)

Size of the site/servitude:

m ²
m ²
m ²

6. SITE ACCESS

Does ready access to the site exist, or is access directly from an existing road?

If NO, what is the distance over which a new access road will be built

YES	NO
New gravel road 150 m long and 5 m wide is required	

Describe the type of access road planned:

Access to the site can be gained from an existing tarred road (R102) that passes approximately 240 m from the site, turning onto a gravel road that runs past the site boundary. A short section of new gravel road, approx 150 m long and 5 m wide, will need to be constructed to get construction and maintenance equipment to the site. (Refer to site maps in Section F – Appendix A).

Include the position of the access road on the site plan.

7. WASTE, EFFLUENT, EMISSION AND NOISE MANAGEMENT

7(a) Solid waste management

Will the activity produce solid construction waste during the construction/initiation phase?

YES	NO
-----	----

² "Alternative A.." refer to activity, process, technology or other alternatives.

If yes, what estimated quantity will be produced per month?

Approx 450 m³ excavated material from turbine foundations and some packaging materials (e.g. wood and cardboard)

How will the construction solid waste be disposed of (describe)?

During construction the expected waste materials are as follows:

- Excavated material from foundations (approx 450 m³ from excavations for the turbine foundations of approximately 15m x 15m x 2m depth). It is intended to utilise this material for compacting of the road, if suitable. The topsoil will be stored and re-used, as it is the intention of Electrawinds to cover the area around the turbine with topsoil and re-establish natural vegetation.
- Packaging material from construction, such as the cardboard, plastic and wooden packaging will be collected and recycled.
- Domestic waste, such as workers lunch packaging, will be collected and disposed of in accordance with CDC's requirements for the IDZ.

Where will the construction solid waste be disposed of (describe)?

Excavated material from construction will be re-used on site, as described above.

Recyclable waste (such as timber packaging) will be sent to a recycling centre, which is to be determined in consultation with CDC.

Will the activity produce solid waste during its operational phase?

YES NO

If yes, what estimated quantity will be produced per month?

m³

How will the solid waste be disposed of (describe)?

Where will the solid waste be disposed if it does not feed into a municipal waste stream (describe)?

If the solid waste (construction or operational phases) will not be disposed of in a registered landfill site or be taken up in a municipal waste stream, the application should consult with the competent authority to determine whether it is necessary to change to an application for scoping and EIA.

Can any part of the solid waste be classified as hazardous in terms of the relevant legislation?

YES NO

If yes, inform the competent authority and request a change to an application for scoping and EIA.

Is the activity that is being applied for a solid waste handling or treatment facility?

YES NO

If yes, the applicant should consult with the competent authority to determine whether it is necessary to change to an application for scoping and EIA.

Describe the measures, if any, that will be taken to ensure the optimal reuse or recycling of materials:

See above - It is the intention of Electrawinds to have all recyclable material, such as the timber packaging and domestic wastes, moved to a recycling plant within PE. Top soil and excavated material will be re-used for the rehabilitation of the site around the base of the turbine.

Has a specialist been consulted to assist with the completion of this section?

YES NO

If YES, please complete:

Name of the specialist:

Qualification(s) of the specialist:

Postal address:

Postal code:

Telephone:

Cell:

E-mail:

Fax:

Are any further specialist studies recommended by the specialist?

YES NO

If YES, specify:

If YES, is such a report(s) attached?

YES NO

Signature of specialist:

Date:

7(b) Liquid effluent

Will the activity produce effluent, other than normal sewage, that will be disposed of in a municipal sewage system?

YES NO

If yes, what estimated quantity will be produced per month?

m³

Will the activity produce any effluent that will be treated and/or disposed of on site?

YES NO

If yes, the applicant should consult with the competent authority to determine whether it is necessary to change to an application for scoping and EIA.

Will the activity produce effluent that will be treated and/or disposed of at another facility?

YES NO

If yes, provide the particulars of the facility:

Facility name:	Veolia Environmental Services SA (Pty) Ltd		
Contact person:	Nelize Fourie		
Postal address:	PO Box 10073, Linton Grange, Port Elizabeth		
Postal code:	6015		
Telephone:	+27 41 453 2911	Cell:	+27 83 419 3110
E-mail:	nelize.fourie@veoliaes.co.za	Fax:	+27 41 453 2918

Describe the measures that will be taken to ensure the optimal reuse or recycling of waste water, if any:

Approximately 10 m³ water will be required during construction for washing of concrete mixing equipment. This wash water will be stored temporarily on site (either in a plastic drum or a plastic-lined pit) and removed by a suitable waste water operator at the end of construction. Prior to commencement of construction, Electrawinds will be required by CDC to prepare a Method Statement that specifies the management procedures for this wash water. Electrawinds will also have to engage a suitable waste contractor to remove the wash water, such as Veolia Environmental Services (who have been appointed by CDC as waste service providers for the IDZ) or a company such as Wastetech.

Has a specialist been consulted to assist with the completion of this section? (note: wash water management was discussed with Viwe Biyana from CDC)	YES	NO
---	-----	----

If YES, please complete:

Name of the specialist:			
Qualification(s) of the specialist:			
Postal address:			
Postal code:			
Telephone:		Cell:	
E-mail:		Fax:	

Are any further specialist studies recommended by the specialist?	YES	NO
---	-----	----

If YES, specify:		
------------------	--	--

If YES, is such a report(s) attached?	YES	NO
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Signature of specialist:	_____	Date:	_____
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7(c) Emissions into the atmosphere

Will the activity release emissions into the atmosphere?	YES	NO
If yes, is it controlled by any legislation of any sphere of government?	YES	NO

If yes, the applicant should consult with the competent authority to determine whether it is necessary to change to an application for scoping and EIA.

If no, describe the emissions in terms of type and concentration:

Has a specialist been consulted to assist with the completion of this section?	YES	NO
--	-----	----

If YES, please complete:

Name of the specialist:			
Qualification(s) of the specialist:			
Postal address:			
Postal code:			
Telephone:		Cell:	
E-mail:		Fax:	

Are any further specialist studies recommended by the specialist?	YES	NO
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If YES, specify:		
------------------	--	--

If YES, is such a report(s) attached?	YES	NO
---------------------------------------	-----	----

Signature of specialist:	_____	Date:	_____
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7(d) Generation of noise

Will the activity generate noise?	YES	NO
If yes, is it controlled by any legislation of any sphere of government?	YES	NO

(note: SANS guidelines exist for noise emissions, as discussed below, and are being applied)

If yes, the applicant should consult with the competent authority to determine whether it is necessary to change to an application for scoping and EIA.

If no, describe the noise in terms of type and level:

Noise during construction phase:

During the construction phase, the noise generated will be mainly caused by the diesel powered equipment, such as the generators used for powering of equipment used for the clearing and also preparation of the land for laying of the foundations. This noise on site will be localised and of short duration. Other construction noise sources include the connection to the power grid, which is minimal and of short duration.

Noise during operations phase:

There is no noise from the operation of the wind measuring mast.

For the 2.3 MW wind turbine, two types of noise occur during operations, i.e. mechanical and aerodynamic. The mechanical noise can be described as a 'hum' or 'whine' and is produced by the mechanical parts found in the base of the turbine. For modern turbines, the mechanical noise is almost entirely eliminated through good insulation materials in the nacelle (European Wind Energy Association, 2009, *Wind Energy – the facts: a guide to the technology, economic and future of wind power*, Earthscan, London, pg 330). The aerodynamic noise refers to the 'swishing' or 'whooshing' of the turbine blades. This noise is emitted from an average height of 100m above ground level (centre of the blades) and has the ability to travel.

For a 2.3 MW Siemens turbine (which is taken as a typical example of the type of turbine that is envisaged for the Coega project), it is predicted that approximately 106 decibels (dBA) of noise would emanate from the centre of the blades. Based on noise measurements conducted for analogous wind turbines in the Western Cape, it is predicated that the noise levels at the base of the turbine will be approximately 60 dBA (CSIR, 2009, *Final EIA Report for Proposed Kouga Wind Energy Project*). Furthermore, data from the Scottish government indicates that at a distance of 350 m from a wind farm the typical noise levels will be 35-45 dB (European Wind Energy Association, 2009, pg 331). The relevant South African noise guidelines are contained in SANS 10103:2008, where Table 2 recommends maximum ambient noise levels for industrial districts to be 70 dBA during the day and 60 dBA at night. Based on the above information, the noise created by the turbine is therefore not expected to cause any significant disturbance to receptors (such as residential areas). Furthermore, the turbine site is situated in the middle of an industrial zone of approximately 10km x 10km in extent. The nearest residential area (Motherwell) is approximately 6 km west of the site. Currently there are no other developments in the immediate vicinity.

It should also be noted that the site is close to two busy roads, i.e. the N2 national road and the R102. The passing traffic will mask the noise of the turbines.

Furthermore, modern turbines have low noise emissions and have strict maintenance requirements to ensure that supplier guarantees apply and that noise emissions are kept to a minimum.

Has a specialist been consulted to assist with the completion of this section?

YES	NO
-----	----

Note from CSIR:

Although a noise specialist has not been consulted for this BA, inputs by noise specialists from analogous wind turbine projects have been used, together with noise specifications provided by Siemens.

If YES, please complete:

Name of the specialist:

Qualification(s) of the specialist:

Postal address:

Postal code:

Telephone: Cell:

E-mail: Fax:

Are any further specialist studies recommended by the specialist?

YES	NO
-----	----

If YES, specify:

If YES, is such a report(s) attached?

YES	NO
-----	----

Signature of specialist: _____ Date:

8. WATER USE

Please indicate the source(s) of water that will be used for the activity by ticking the appropriate box(es)

municipal	water board	groundwater	river, stream, dam or lake	other	the activity will not use water
				Water is required to wash the equipment used for working with concrete. This water (approx 10 m3) will be brought in trucks to the site. Waste water will be stored and removed from site via the same / different trucks.	

If water is to be extracted from groundwater, river, stream, dam, lake or any other natural feature, please indicate

the volume that will be extracted per month:

Does the activity require a water use permit from the Department of Water Affairs and Forestry?

	liters
YES	NO

If yes, please submit the necessary application to the Department of Water Affairs and Forestry and attach proof thereof to this application if it has been submitted.

Note: Approx 10 m³ water will be required during construction to wash the equipment used for working with concrete. The dirty wash water will be stored on site and removed by a suitable waste water operator at the end of construction.

9. ENERGY EFFICIENCY

Describe the design measures, if any, that have been taken to ensure that the activity is energy efficient:

This project will produce 'clean' energy when it is complete. During construction, though, energy will be provided by means of generators.

Describe how alternative energy sources have been taken into account or been built into the design of the activity, if any:

10. SITE OR ROUTE PLAN

A detailed site or route plan(s) must be prepared for each alternative site or alternative activity. It must be attached as **Appendix A** to this document. The site or route plans must indicate the following:

- 10(a) The scale of the plan which must be at least a scale of 1:500;
- 10(b) the property boundaries and numbers of all the properties within 50m of the site;
- 10(c) the current land use as well as the land use zoning of each of the properties adjoining the site or sites;
- 10(d) the exact position of each element of the application as well as any other structures on the site;
- 10(e) the position of services, including electricity supply cables (indicate above or underground), water supply pipelines, boreholes, street lights, sewage pipelines, storm water infrastructure and telecommunication infrastructure;
- 10(f) all trees and shrubs taller than 1.8m;
- 10(g) walls and fencing including details of the height and construction material;
- 10(h) servitudes indicating the purpose of the servitude;
- 10(i) sensitive environmental elements within 100m of the site or sites including (but not limited thereto):
 - rivers;
 - the 1:100 year flood line (where available or where it is required by DWAF);
 - ridges;
 - cultural and historical features;
 - areas with indigenous vegetation (even if it is degraded or invested with alien species);
- 10(j) for gentle slopes the 1m contour intervals must be indicated on the plan and whenever the slope of the site exceeds 1:10, the 500mm contours must be indicated on the plan; and
- 10(k) the positions from where photographs of the site were taken.

11. SITE PHOTOGRAPHS

Colour photographs from the center of the site must be taken in at least the eight major compass directions with a description of each photograph. Photographs must be attached under **Appendix B** to this form. It should be supplemented with additional photographs of relevant features on the site, if applicable.

12. FACILITY ILLUSTRATION

A detailed illustration of the activity must be provided at a scale of 1:200 as **Appendix C** for activities that include structures. The illustrations must be to scale and must represent a realistic image of the planned activity. The illustration must give a representative view of the activity.

13. ACTIVITY MOTIVATION

13(a) Socio-economic value of the activity

What is the expected capital value of the activity on completion?

Capital cost for single wind turbine
Capital cost for wind measuring mast

What is the expected yearly income that will be generated by or as a result of the activity?

R
€ 5 million
€ 45 000
R

The feed-in tariff announced earlier this year (1 April 2009) specified R 1.25 per kWh. However, actual income will be dependent on the availability of the wind at any given time period. A wind capacity factor of approximately 30% is anticipated.

Will the activity contribute to service infrastructure or is it a public amenity?

Initially the energy is intended to focus on the FIFA 2010 World Cup matches to be held in PE. Subsequently, this energy will be fed into the mainstream power supply of the NMBM.

How many new employment opportunities will be created in the development phase of the activity?

What is the expected value of the employment opportunities during the development phase?

What percentage of this will accrue to previously disadvantaged individuals?

How many permanent new employment opportunities will be created during the operational phase of the activity?

What is the expected current value of the employment opportunities during the first 10 years?

What percentage of this will accrue to previously disadvantaged individuals?

YES	NO
Approx 100 direct jobs	
R (not determined at this stage)	
%	
4 direct permanent jobs	
R (not determined at this stage)	
%	

TRAINING AND SKILLS DEVELOPMENT: It should also be noted that Electrawinds has committed to a bursary scheme commencing with an annual value of 18 000 EURO in 2010; and increasing to 24 000 EURO's for the first five years of the exploitation of the project. This will aim at providing engineering training in the field of wind energy for Previously Disadvantaged Individuals (PDIs).

13(b) Need and desirability of the activity

Motivate and explain the need and desirability of the activity (including demand for the activity):

Need at a provincial and local scale: The Nelson Mandela Metropolitan Municipality (NMBM) is situated in the economically disadvantaged Eastern Cape Province of South Africa. It has potential for significant development in both the industrial and rural sectors. However, this type of development, particularly the former, is hampered by a lack of additional power, especially to new industrial developments like the Coega IDZ. Currently the NMBM uses an estimated 600 to 700 MW of power and is entirely reliant on electricity imports from other provinces. The NMBM has embarked on a renewable energy campaign that aims to provide at least 10 % of its energy from renewable sources, such as wind and solar.

The complete Electrawinds project, which proposes to produce an estimated 57.5 MW, will make a meaningful contribution towards the 10 % renewable energy target of the NMBM, albeit that Phase 1 (the subject of this Basic Assessment) will only make a small contribution to the Metro power supply (i.e. 2.3 MW).

At a national scale, renewable energy is a priority for South Africa, as confirmed by the announcement by government on 1 April 2009 of favourable feed-in tariffs for renewable energy sources such as wind energy. The tariff for wind energy is R1.25 / kWh.

Indicate any benefits that the activity will have for society in general:

1) Improving the knowledge base for wind projects:
The wind mast data will provide the basis for further planning and investment by Electrawinds in the proposed 57.5 MW project at Coega. This complete project will make a meaningful contribution to the power supply for the NMBM area.

2) Meeting NMBM targets for renewable energy:
This project is in line with the NMBM's target of reaching a 10% renewable energy usage.

3) Promoting Port Elizabeth as a leader in renewable energy:
It is proposed that the energy generated by this turbine (2.3 MW) be fed into the NMBM grid for the 2010 FIFA soccer matches to be held in Port Elizabeth. While the actual power contribution is small, the project will create the opportunity to promote PE as a leader in renewable energy.

4) Energy provision for the NMBM area
In the longer term it is intended that the power (2.3 MW) be utilised for generation for the greater population. Phase 1 will serve as a pilot project for producing renewable, non-polluting energy for PE.

Indicate any benefits that the activity will have for the local communities where the activity will be located:

This is a non-polluting energy source, i.e. there are no atmospheric emissions.

The main impact on communities will be related to socio-economic opportunities from increased power supply.

The turbine will have a visual impact (discussed below) which affects the “sense of place”. However, given the project location in the midst of an IDZ, this is considered an appropriate visual context for a turbine.

14. APPLICABLE LEGISLATION, POLICIES AND/OR GUIDELINES

List all legislation, policies and/or guidelines of any sphere of government that are applicable to the application as contemplated in the EIA regulations, if applicable:

Title of legislation, policy or guideline:

Administering authority:

Date:

National Environmental Management Act	DWEA	1998
National Environmental Management Act, Regulations (R 386)	DWEA	2006
National Environmental Management: Biodiversity Act	DWEA	2004
National Heritage Resources Act	SAHRA	1999
Aviation Act	Civil Aviation Authority	1962
Aviation Regulations	Civil Aviation Authority	1997
SANS 10103 : 2008 Edition 6 (noise guidelines)	SABS	2008
Coega Open Space Management Plan: Draft Management Guidelines, Part 2 management guidelines	CDC	2003

SECTION C: SITE/AREA DESCRIPTION

Important note: For linear activities (pipelines etc) as well as activities that cover very large sites, it may be necessary to complete Section C for each part of the site that has a significantly different environment. In such cases please complete copies of Section C and indicate the area, which is covered by each copy No. on the Site Plan.

Section C Copy No. (e.g. A):
(complete only when appropriate)

1. GRADIENT OF THE SITE

Indicate the general gradient of the sites.

Alternative S1:

Flat	1:50 – 1:20	1:20 – 1:15	1:15 – 1:10	1:10 – 1:7,5	1:7,5 – 1:5	Steeper than 1:5
------	-------------	-------------	-------------	--------------	-------------	------------------

Alternative S2:

Flat	1:50 – 1:20	1:20 – 1:15	1:15 – 1:10	1:10 – 1:7,5	1:7,5 – 1:5	Steeper than 1:5
------	-------------	-------------	-------------	--------------	-------------	------------------

Alternative S3:

Flat	1:50 – 1:20	1:20 – 1:15	1:15 – 1:10	1:10 – 1:7,5	1:7,5 – 1:5	Steeper than 1:5
------	-------------	-------------	-------------	--------------	-------------	------------------

2. LOCATION IN LANDSCAPE

Indicate the landform(s) that best describes the site.

Alternative S1:

Ridgeline	Plateau	Side slope of hill/mountain	Closed valley	Open valley	Plain	Undulating plain/low hills	Dune	Sea-front
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Alternative S2:

Ridgeline	Plateau	Side slope of hill/mountain	Closed valley	Open valley	Plain	Undulating plain/low hills	Dune	Sea-front
-----------	---------	-----------------------------	---------------	-------------	-------	----------------------------	------	-----------

Alternative S3:

Ridgeline	Plateau	Side slope of hill/mountain	Closed valley	Open valley	Plain	Undulating plain/low hills	Dune	Sea-front
-----------	---------	-----------------------------	---------------	-------------	-------	----------------------------	------	-----------

3. GROUNDWATER, SOIL AND GEOLOGICAL STABILITY OF THE SITE

Is the site(s) located on any of the following (tick the appropriate boxes)?

	Alternative S1:		Alternative S2:		Alternative S3:	
	YES	NO	YES	NO	YES	NO
Shallow water table (less than 1.5m deep)						
Groundwater is deep, i.e. > 15 m below the surface, based on studies at other sites on the coastal plateau of the IDZ						
Dolomite, sinkhole or doline areas	YES	NO	YES	NO	YES	NO
Seasonally wet soils (often close to water bodies)	YES	NO	YES	NO	YES	NO
Unstable rocky slopes or steep slopes with loose soil	YES	NO	YES	NO	YES	NO
Dispersive soils (soils that dissolve in water)	YES	NO	YES	NO	YES	NO
Soils with high clay content (clay fraction more than 40%)	YES	NO	YES	NO	YES	NO
Any other unstable soil or geological feature	YES	NO	YES	NO	YES	NO
The Coega fault is nearby, but site # 25 is in a stable area.						
An area sensitive to erosion	YES	NO	YES	NO	YES	NO

If you are unsure about any of the above or if you are concerned that any of the above aspects may be an issue of concern in the application, an appropriate specialist should be appointed to assist in the completion of this section. (Information in respect of the above will often be available as part of the project information or at the planning sections of local authorities. Where it exists, the 1:50 000 scale Regional Geotechnical Maps prepared by the Council for Geo Science may also be consulted).

Has a specialist been consulted to assist with the completion of this section?

YES	NO
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Note: In preparing this BA report, the CSIR team drew on relevant references such as: Coega IDZ SEA Report (CSIR, 1997); EIA for the rezoning of the core development area of the Coega IDZ (CES, 2000-2001), EIA for the rezoning of the remainder of the Coega IDZ (SRK, 2006), Pechiney Aluminium Smelter EIA (CSIR, 2002), Technology Review for the proposed Coega Aluminium Smelter (CSIR, 2005), SANS noise guidelines, EIA for the proposed Kouga Wind Energy Project at Jeffreys Bay (CSIR, 2008) and recent revisions of the Coega Open Space Management Plan.

If YES, please complete:

Name of the specialist: _____
 Qualification(s) of the specialist: _____
 Postal address: _____
 Postal code: _____
 Telephone: _____ Cell: _____
 E-mail: _____ Fax: _____
 Are any further specialist studies recommended by the specialist? YES NO
 If YES, specify: _____
 If YES, is such a report(s) attached? YES NO

Signature of specialist: _____ Date: _____

4. GROUNDCOVER

Tick the types of groundcover present on the site.

Alternative S1:

Natural veld – good condition ^E	Natural veld with scattered aliens ^E	Natural veld with heavy alien infestation ^E	Veld dominated by alien species ^E	Gardens
Sport field	Cultivated land	Paved surface	Building or other structure	Bare soil

If any of the boxes marked with an ^E "is ticked, please consult an appropriate specialist to assist in the completion of this section if the environmental assessment practitioner doesn't have the necessary expertise.

Has a specialist been consulted?

YES	NO
-----	----

Several botanical studies have been completed for the Coega IDZ which informed the development of the Coega Open Space System, which aims to conserve areas of valuable habitat. The Electrawinds site falls just outside the mesic succulent thicket (MST) area and outside the Open Space System as demarcated by CDC. A short section of the existing access road passes through a corner of the OSS and this matter is discussed in Section E.

If YES, please complete the following:

Name of the specialist: _____
 Qualification(s) of the specialist: _____
 Postal address: _____
 Postal code: _____
 Telephone: _____ Cell: _____
 E-mail: _____ Fax: _____
 Are there any rare or endangered flora or fauna species (including red data species) present on any of the alternative sites? YES NO
 If YES, specify and explain: _____
 Are there any special or sensitive habitats or other natural features present on any of the alternative sites? YES NO
 If YES, specify and explain: _____
 Are any further specialist studies recommended by the specialist? YES NO
 If YES, specify: _____
 If YES, is such a report(s) attached? YES NO

Signature of specialist: _____ Date: _____

The location of all identified rare or endangered species or other elements should be accurately indicated on the site plan(s).

Alternative S2:

Natural veld – good condition ^E	Natural veld with scattered aliens ^E	Natural veld with heavy alien infestation ^E	Veld dominated by alien species ^E	Gardens
Sport field	Cultivated land	Paved surface	Building or other structure	Bare soil

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If any of the boxes marked with an "E" is ticked, please consult an appropriate specialist to assist in the completion of this section if the environmental assessment practitioner doesn't have the necessary expertise.

Has a specialist been consulted? YES NO

If YES, please complete the following:

Name of the specialist: _____
 Qualification(s) of the specialist: _____
 Postal address: _____
 Postal code: _____
 Telephone: _____ Cell: _____
 E-mail: _____ Fax: _____

Are there any rare or endangered flora or fauna species (including red data species) present on any of the alternative sites? YES NO

If YES, specify and explain: _____

Are there any special or sensitive habitats or other natural features present on any of the alternative sites? YES NO

If YES, specify and explain: _____

Are any further specialist studies recommended by the specialist? YES NO

If YES, specify: _____

If YES, is such a report(s) attached? YES NO

Signature of specialist: _____ Date: _____

The location of all identified rare or endangered species or other elements should be accurately indicated on the site plan(s).

Alternative S3:

Natural veld - good condition ^E	Natural veld with scattered aliens ^E	Natural veld with heavy alien infestation ^E	Veld dominated by alien species ^E	Gardens
Sport field	Cultivated land	Paved surface	Building or other structure	Bare soil

If any of the boxes marked with an "E" is ticked, please consult an appropriate specialist to assist in the completion of this section if the environmental assessment practitioner doesn't have the necessary expertise.

Has a specialist been consulted? YES NO

If YES, please complete the following:

Name of the specialist: _____
 Qualification(s) of the specialist: _____
 Postal address: _____
 Postal code: _____
 Telephone: _____ Cell: _____
 E-mail: _____ Fax: _____

Are there any rare or endangered flora or fauna species (including red data species) present on any of the alternative sites? YES NO

If YES, specify and explain: _____

Are there any special or sensitive habitats or other natural features present on any of the alternative sites? YES NO

If YES, specify and explain: _____

Are any further specialist studies recommended by the specialist? YES NO

If YES, specify: _____

If YES, is such a report(s) attached? YES NO

Signature of specialist: _____ Date: _____

The location of all identified rare or endangered species or other elements should be accurately indicated on the site plan(s).

5. LAND USE CHARACTER OF SURROUNDING AREA

Black out land uses and/or prominent features that does not currently occur within a 500m radius of the site

Alternative S1:

Natural area	Low-density residential	Medium-density residential	High-density residential	Informal residential ^A
Retail	Commercial & warehousing	Light-industrial	Medium-industrial ^{AN}	Heavy industrial ^{AN}
Power-station ^A	Office/consulting room	Military or police base/station/compound	Casino/entertainment complex	Hospitality facility
Open-cast mine	Underground mine	Spoil heap or slimes dam ^A	Quarry, sand or borrow pit	Dam or reservoir
Hospital/medical center	School	Tertiary-education facility	Church	Old-age home

Sewage treatment plant ^A	Train station or shunting yard ^N	Railway line ^N	Major road (4 lanes or more) – N2 is upgraded to 4 lanes	Airport ^N
Harbour	Sport facilities	Golf course	Polo fields	Filling station ^N
Landfill or waste treatment site ^A	Plantation	Agriculture	River, stream or wetland	Nature conservation area
Mountain, koppie or ridge	Museum	Historical building	Graveyard	Archeological site
Other land uses (describe):	<p>Currently there are no developments surrounding the site, except for:</p> <ul style="list-style-type: none"> (i) The Dedisa substation is in close proximity (approx 500 m); (ii) The Algoa Brick quarry situated approx 100 m from the site; (iii) The roads, both the gravel road leading to the quarry and the tarred road (R102); and (iv) The powerlines (400 kV, 132 kV and 11 kV) (v) The N2 Highway, is approximately 500 m south of the monitoring mast site, and is currently being upgraded to a 4 lane highway. 			

If any of the boxes marked with an ^N are ticked, please consult an appropriate noise specialist to assist in the completion of this section.

Has a specialist been consulted? YES NO

If YES, please complete the following:

Name of the specialist: _____

Qualification(s) of the specialist: _____

Postal address: _____

Postal code: _____

Telephone: _____ Cell: _____

E-mail: _____ Fax: _____

Will the ambient noise level have a negative impact on the proposed activity? YES NO

If YES, specify and explain: _____

Are any further specialist or studies recommended by the specialist? YES NO

If YES, specify: _____

If YES, is such a report(s) attached? YES NO

Signature of specialist: _____ Date: _____

If any of the boxes marked with an ^A are ticked, please consult an appropriate air quality specialist to assist in the completion of this section.

Has a specialist been consulted? YES NO

If YES, please complete the following:

Name of the specialist: _____

Qualification(s) of the specialist: _____

Postal address: _____

Postal code: _____

Telephone: _____ Cell: _____

E-mail: _____ Fax: _____

Will the ambient air pollution level have a negative impact on the proposed activity? YES NO

If YES, specify and explain: _____

Are any further specialist studies recommended by the specialist? YES NO

If YES, specify: _____

If YES, is such a report(s) attached? YES NO

Signature of specialist: _____ Date: _____

If any of the boxes marked with an ^H are ticked, please consult an appropriate health assessment specialist to assist in the completion of this section.

Has a specialist been consulted? YES NO

If YES, please complete the following:

Name of the specialist: _____

Qualification(s) of the specialist: _____

Postal address: _____

Postal code: _____

Telephone: _____ Cell: _____

E-mail: _____ Fax: _____

Will the surrounding land use pose any unacceptable health risk on the proposed activity? YES NO

If YES, specify and explain: _____

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Are any further specialist studies recommended by the specialist? YES NO
 If YES, specify: _____
 If YES, is such a report(s) attached? YES NO

Signature of specialist: _____ Date: _____

Alternative S2:

Natural area	Low density residential	Medium density residential	High density residential	Informal residential ^A
Retail	Commercial & warehousing	Light industrial	Medium industrial ^{A/N}	Heavy industrial ^{A/N}
Power station ^A	Office/consulting room	Military or police base/station/compound	Casino/entertainment complex	Hospitality facility
Open cast mine	Underground mine	Spoil heap or slimes dam ^A	Quarry, sand or borrow pit	Dam or reservoir
Hospital/medical center	School	Tertiary education facility	Church	Old age home
Sewage treatment plant ^A	Train station or shunting yard ^N	Railway line ^N	Major road (4 lanes or more) ^N	Airport ^N
Harbour	Sport facilities	Golf course	Polo fields	Filling station ^N
Landfill or waste treatment site ^A	Plantation	Agriculture	River, stream or wetland	Nature conservation area
Mountain, koppie or ridge	Museum	Historical building	Graveyard	Archeological site
Other land uses (describe):				

If any of the boxes marked with an ^{A/N} are ticked, please consult an appropriate noise specialist to assist in the completion of this section.

Has a specialist been consulted? YES NO

If YES, please complete the following:

Name of the specialist: _____
 Qualification(s) of the specialist: _____
 Postal address: _____
 Postal code: _____
 Telephone: _____ Cell: _____
 E-mail: _____ Fax: _____

Will the ambient noise level have a negative impact on the proposed activity? YES NO

If YES, specify and explain: _____

Are any further specialist studies recommended by the specialist? YES NO

If YES, specify: _____

If YES, is such a report(s) attached? YES NO

Signature of specialist: _____ Date: _____

If any of the boxes marked with an ^{A/N} are ticked, please consult an appropriate air quality specialist to assist in the completion of this section.

Has a specialist been consulted? YES NO

If YES, please complete the following:

Name of the specialist: _____
 Qualification(s) of the specialist: _____
 Postal address: _____
 Postal code: _____
 Telephone: _____ Cell: _____
 E-mail: _____ Fax: _____

Will the ambient air pollution level have a negative impact on the proposed activity? YES NO

If YES, specify and explain: _____

Are any further specialist studies recommended by the specialist? YES NO

If YES, specify: _____

If YES, is such a report(s) attached? YES NO

Signature of specialist: _____ Date: _____

If any of the boxes marked with an ^{A/N} are ticked, please consult an appropriate health assessment specialist to assist in the completion of this section.

Has a specialist been consulted? YES NO

If YES, please complete the following:

Name of the specialist: _____

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Qualification(s) of the specialist: _____
 Postal address: _____
 Postal code: _____
 Telephone: _____ Cell: _____
 E-mail: _____ Fax: _____

Will the surrounding land use pose any unacceptable health risk on the proposed activity? YES NO
 If YES, specify and explain: _____

Are any further specialist studies recommended by the specialist? YES NO
 If YES, specify: _____

If YES, is such a report(s) attached? YES NO

Signature of specialist: _____ Date: _____

Alternative S3:

Natural area	Low density residential	Medium density residential	High density residential	Informal residential ^A
Retail	Commercial & warehousing	Light industrial	Medium industrial ^{NH}	Heavy industrial ^{NH}
Power station ^A	Office/consulting room	Military or police base/station/compound	Casino/entertainment complex	Hospitality facility
Open cast mine	Underground mine	Spoil heap or slimes dam ^A	Quarry, sand or borrow pit	Dam or reservoir
Hospital/medical center	School	Tertiary education facility	Church	Old age home
Sewage treatment plant ^A	Train station or shunting yard ^N	Railway line ^N	Major road (4 lanes or more) ^N	Airport ^N
Harbour	Sport facilities	Golf course	Polo fields	Filling station ^H
Landfill or waste treatment site ^H	Plantation	Agriculture	River, stream or wetland	Nature conservation area
Mountain, koppie or ridge	Museum	Historical building	Graveyard	Archeological site
Other land uses (describe):				

If any of the boxes marked with an ^{NH} are ticked, please consult an appropriate noise specialist to assist in the completion of this section.

Has a specialist been consulted? YES NO

If YES, please complete the following:

Name of the specialist: _____
 Qualification(s) of the specialist: _____
 Postal address: _____
 Postal code: _____
 Telephone: _____ Cell: _____
 E-mail: _____ Fax: _____

Will the ambient noise level have a negative impact on the proposed activity? YES NO
 If YES, specify and explain: _____

Are any further specialist studies recommended by the specialist? YES NO
 If YES, specify: _____

If YES, is such a report(s) attached? YES NO

Signature of specialist: _____ Date: _____

If any of the boxes marked with an ^{AH} are ticked, please consult an appropriate air quality specialist to assist in the completion of this section.

Has a specialist been consulted? YES NO

If YES, please complete the following:

Name of the specialist: _____
 Qualification(s) of the specialist: _____
 Postal address: _____
 Postal code: _____
 Telephone: _____ Cell: _____
 E-mail: _____ Fax: _____

Will the ambient air pollution level have a negative impact on the proposed activity? YES NO
 If YES, specify and explain: _____

Are any further specialist studies recommended by the specialist? YES NO
 If YES, specify: _____

If YES, is such a report(s) attached? YES NO

Signature of specialist: _____ Date: _____

If any of the boxes marked with an ^{ab} are ticked, please consult an appropriate health assessment specialist to assist in the completion of this section.

Has a specialist been consulted?

YES	NO
-----	----

If YES, please complete the following.

Name of the specialist: _____

Qualification(s) of the specialist: _____

Postal address: _____

Postal code: _____

Telephone: _____ Cell: _____

E-mail: _____ Fax: _____

Will the surrounding land use pose any unacceptable health risk on the proposed activity?

YES	NO
-----	----

If YES, specify and explain: _____

Are any further specialist studies recommended by the specialist?

YES	NO
-----	----

If YES, specify: _____

If YES, is such a report(s) attached?

--	--

Signature of specialist: _____ Date: _____

6. CULTURAL/HISTORICAL FEATURES

Alternative S1

Are there any signs of culturally or historically significant elements, as defined in section 2 of the National Heritage Resources Act, 1999, (Act No. 25 of 1999), including archaeological or palaeontological sites, on or close (within 20m) to the site?

YES	NO
Uncertain	

If YES, explain: _____

If uncertain, conduct a specialist investigation by a recognised specialist in the field to establish whether there is such a feature(s) present on or close to the site.

Briefly explain the findings of the specialist:

As part of the development of the EIA for the Rezoning of the IDZ and the preparation of the Coega Open Space System, heritage features such as graves were identified and incorporated into the Open Space mapping. There are no identified heritage features on the Electrawinds site. During 2010, a comprehensive Heritage Impact Assessment will be conducted under the auspices of CDC for the entire IDZ.

Will any building or structure older than 60 years be affected in any way?

YES	NO
-----	----

Is it necessary to apply for a permit in terms of the National Heritage Resources Act, 1999 (Act 25 of 1999)?

YES	NO
-----	----

If yes, please submit or, make sure that the applicant or a specialist submits the necessary application to SAHRA or the relevant provincial heritage agency and attach proof thereof to this application if such application has been made.

Alternative S2

Are there any signs of culturally or historically significant elements, as defined in section 2 of the National Heritage Resources Act, 1999, (Act No. 25 of 1999), including archaeological or palaeontological sites, on or close (within 20m) to the site?

YES	NO
Uncertain	

If YES, explain: _____

If uncertain, conduct a specialist investigation by a recognised specialist in the field to establish whether there is such a feature(s) present on or close to the site.

Briefly explain the findings of the specialist: _____

Will any building or structure older than 60 years be affected in any way?

YES	NO
-----	----

Is it necessary to apply for a permit in terms of the National Heritage Resources Act, 1999 (Act 25 of 1999)?

YES	NO
-----	----

If yes, please submit or, make sure that the applicant or a specialist submits the necessary application to SAHRA or the relevant provincial heritage agency and attach proof thereof to this application if such application has been made.

Alternative S3

Are there any signs of culturally or historically significant elements, as defined in section 2 of the National Heritage Resources Act, 1999, (Act No. 25 of 1999), including archaeological or palaeontological sites, on or close (within 20m) to the site?

YES	NO
Uncertain	

If YES, explain: _____

If uncertain, conduct a specialist investigation by a recognised specialist in the field to establish whether there is such a feature(s) present on or close to the site.

Briefly explain the findings of the specialist: _____

BASIC ASSESSMENT REPORT FOR ELECTRAWINDS PROJECT AT COEGA – NOVEMBER 2009

Will any building or structure older than 60 years be affected in any way?

YES	NO
YES	NO

Is it necessary to apply for a permit in terms of the National Heritage Resources Act, 1999 (Act 25 of 1999)?

If yes, please submit or make sure that the applicant or a specialist submits the necessary application to SAHRA or the relevant provincial heritage agency and attach proof thereof to this application if such application has been made.

SECTION D: PUBLIC PARTICIPATION

1. ADVERTISEMENT

The environmental assessment practitioner must follow any relevant guidelines adopted by the competent authority in respect of public participation and must at least –

- 1(a) Fix a notice in a conspicuous place, on the property where it is intended to undertake the activity which states that an application will be submitted to the competent authority in terms of these regulations and which provides information on the proposed nature and location of the activity, where further information on the proposed activity can be obtained and the manner in which representations on the application may be made.

As the Coega Industrial Development Zone is a restricted area a notice board was not placed at the site but on an electronic notice board at the reception area of the Coega Development Corporation offices. A copy of the e-notice board is included in Appendix E.1 with this application

- 1(b) inform landowners and occupiers of adjacent land of the applicant's intention to submit an application to the competent authority

See response to 1(c) below

- 1(c) inform landowners and occupiers of land within 100 metres of the boundary of the property where it is proposed to undertake the activity and whom may be directly affected by the proposed activity of the applicant's intention to submit an application to the competent authority;

Public Participation Process prior to the Review of the Draft Basic Assessment Report

The site is within Zone 9 of the Coega IDZ, a declared industrial development zone, the majority of the land within the IDZ is owned by the Coega Development Corporation, with certain exceptions in some areas. The exception in this instance is a quarry adjacent to the site which is owned by Algoa Brick, which was included on the project database.

All other interested and affected parties were identified and included on the project database in consultation with the Coega Industrial Zone and Electrawinds representatives.

All I&APs were sent notification of the Basic Assessment at the outset of the process (Letter 1 to I&APs). Included in Letter 1 was a Background Information Document on the proposed project, a locality map and comment form (contained in Appendix E in Section F).

Section 4 below provides more detail on the Public Participation process followed for this assessment. A copy of the project database is contained Appendix E.2 and correspondence sent to I&APs is in Appendix E.3 (both in Section F).

I&AP Review Process for the Draft Basic Assessment Report

All I&APs registered on the project database were notified of the release of the Draft Basic Assessment Report for a 40 day review period extending from 8 October 2009 to 18 November 2009. Included with this correspondence was an executive summary of the Draft Basic Assessment Report and a comment form. The full report was also made available through the website www.publicprocess.co.za. A copy of the project database is contained as Appendix E.2 (Section F) and copies of all correspondence sent to I&APs is also included in Appendices E.3 and E. (both in Section F).

Correspondence was received from seven I&APs during the DBAR review process. Interaction with I&APs is indicated in the project database which is included in Appendix H.1. At the time of the submission of the Final Basic Assessment Report there were 57 I&APs registered on the project database. All comments received from I&APs during the review of the Draft Basic Assessment Report are reflected in comments and responses trail in Appendix J: (Section F) and copies of all correspondence received are included in Appendix I.

- 1(d) inform the ward councillor and any organisation that represents the community in the area of the applicant's intention to submit an application to the competent authority;

Cllr Linda Mlomo (Ward 53 Councillor), the Wildlife and Environment Society EP Division and the Zwartkops Trust have been included on the I&AP database and provided with copies of all the relevant correspondence. See Section 4 below for more detail on the Public Participation Process. A copy of the database is contained in Appendix E.2 (Section F).

- 1(e) inform the municipality which has jurisdiction over the area in which the proposed activity will be undertaken of the applicant's intention to submit an application to the competent authority; and

The NMBM was identified and included on the project database, in particular the NMBM Environmental sub-directorate, NMBM Waste Water and NMBM Air Quality Division (See Appendix E.2).

- 1(f) inform any organ of state that may have jurisdiction over any aspect of the activity of the applicant's intention to submit an application to the competent authority; and

The stakeholder database in Appendix E.2 of this application includes all National and Provincial organs of state that were identified and included in the BA process. This includes contact details provided by CDC for all the representatives of the Coega Environmental Liaison Committee (Coega ELC).

A presentation on the proposed project was given to the Coega ELC on 27 August 2009 by Paul Lochner (CSIR) and Emil Unger (Electrawinds).

- 1(g) place a notice in one local newspaper and any *Gazette* that is published specifically for the purpose of providing notice to the public of applications made in terms of these regulations.

A Newspaper advertisement was placed in "The Herald" on 28 August 2009. A copy of the advertisement is included in Appendix E.4.

2. CONTENT OF ADVERTISEMENTS AND NOTICES

Advertisements and notices must indicate that an application will be submitted to the competent authority in terms of the EIA regulations, the nature and location of the activity, where further information on the proposed activity can be obtained and the manner in which representations in respect of the application can be made;

A newspaper advert was placed in the Herald on the 28 August 2009 and an electronic notice placed at the reception area of the Coega Development Corporation offices (as outlined in Section 1 (a) above). A copy of the newspaper advert and e-notice board are contained in Appendix E.

3. PLACEMENT OF ADVERTISEMENTS AND NOTICES

Where the proposed activity may have impacts that extend beyond the municipal area where it is located, a notice must be placed in at least one provincial newspaper or national newspaper, indicating that an application will be submitted to the competent authority in terms of these regulations, the nature and location of the activity, where further information on the proposed activity can be obtained and the manner in which representations in respect of the application can be made, unless a notice has been placed in any *Gazette* that is published specifically for the purpose of providing notice to the public of applications made in terms of the EIA regulations.

Advertisements and notices must make provision for site alternatives where appropriate.

Copies of the newspaper adverts and notice board are contained in Appendix E.

4. DETERMINATION OF APPROPRIATE MEASURES

The practitioner must ensure that the public participation is adequate and must determine whether a public meeting or any other additional measure is appropriate or not based on the particular nature of each case. Special attention should be given to the involvement of local community structures such as Ward Committees, ratepayers associations and traditional authorities where appropriate. Please note that public concerns that emerge at a later stage that should have been addressed may cause the competent authority to withdraw any authorisation it may have issued if it becomes apparent that the public participation process was inadequate.

The public participation process up until the release of the Draft Basic Assessment Report is summarised below:

PUBLIC PARTICIPATION PROCESS PRIOR TO RELEASE OF THE DRAFT BASIC ASSESSMENT REPORT

- Advertisement - The Herald, 28 August 2009
- Notice board at the site - electronic notice placed at the Coega Development Corporations Reception area
- Registration and Comment Period – All I&APs were provided with a 30 day period from 28 August to 28 September 2009 within which to register their interest on the database or raise issues of concern for inclusion in the Draft BA Report (Letter 1 to I&APs). I&APs registered on the project database were provided with written notification of the 40 day comment period for the Draft Basic Assessment (see section below for more detail).
- Notice to surrounding landowners – see section 1(c) (d) and (f) above
- Identification of key stakeholders - One mechanism to identify I&APs is through media advertisements. In addition the following I&AP groups were proactively identified, included on the project database and notified of the process:
 - Environmental Groups – Wildlife and Environment Society of SA (WESSA) and Zwartkops Trust
 - Members of the Coega Environmental Liaison Committee (ELC)
 - Organisations/Business – South African Wind Energy Association and Palm Tree Power (existing wind energy proponent in the IDZ)
 - Ward Councillor – Ward 53, NMBM
 - Local Authority – NMBM
 - Aviation – Civil Aviation Authority, PE Airports Company
 - Organs of State – Eskom, SANParks, SAHRA
 - Surrounding Landowners – as outlined in section 1(c)

- Information dissemination and availability – project information has been made available on the website www.publicprocess.co.za. Affected organs of state received a CD or hard copy of the Draft Report.

REVIEW PROCESS FOR THE DRAFT BASIC ASSESSMENT REPORT

- All I&APs registered on the project database were notified in writing of the release of the Draft Basic Assessment Report for a 40 day review period from the 8 October 2009 to 18 November 2009. Included with this correspondence was an executive summary of the Draft Basic Assessment Report and a comment form.
- The full report was also made available through the website www.publicprocess.co.za
- Affected organs of state were provided with either a CD or hard copy of the report.
- Section 4 below provides more detail on the Public Participation process followed for this assessment.
- Communication was received from seven I&APs during the DBAR review process. All comments received from I&APs during the review of the Draft Basic Assessment Report are reflected in comments and responses trail in Appendix E.9 (Section F) and copies of original correspondence received are included in Appendix E.8.
- Interaction with I&APs is indicated in the project database which is included in Section F Appendix E. At the time of the submission of the Final Basic Assessment Report there were 77 I&APs registered on the project database (Appendix E.2). Correspondence sent to I&APs on the Draft BA Report is provided in Appendix E.7. Comments received from I&APs during the Draft Basic Assessment Report review process have been included in an additional table in the Comments and Responses Trail (Appendix E.8). All comments received from I&APs are captured in Appendix E.9, the Comments and Response Report, which includes responses from Electrawinds and/or the CSIR EIA team.

5. COMMENTS AND RESPONSE REPORT

The practitioner must record all comments and respond to each comment of the public before the application is submitted. The comments and responses must be captured in a comments and response report as prescribed in the EIA regulations and be attached to this application. The comments and response report must be attached under Appendix E.

All comments received from I&APs on the Draft BA Report have been included in Appendix E.8 of this report. Comments and responses are provided in Appendix E.9.

6. LOCAL AUTHORITY PARTICIPATION

Local authorities are key interested and affected parties in each application and no decision on any application will be made before the relevant local authority is provided with the opportunity to give input. The planning and the environmental sections of the local authority must be informed of the application at least 30 (thirty) calendar days before the submission of the application.

Has any comment been received from the local authority?

YES	NO
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If "YES", briefly describe the feedback below (also attach any correspondence to and from the local authority to this application):

At the ELC meeting held on the 27th August 2009 which included members from National, Provincial and local authorities as well as parastatals.

At the meeting held with Nelson Mandela Bay Municipality (NMBM) Electricity Department on 11 September 2009, Mr Tyrone Ferndale (NMBM) iterated that they are willing to receive the power generated by the single turbine via their existing powerline that runs from the Dedisa into the Metro supply.

7. CONSULTATION WITH OTHER STAKEHOLDERS

Any stakeholder that has a direct interest in the site or property, such as servitude holders and service providers, should be informed of the application at least 30 (thirty) calendar days before the submission of the application and be provided with the opportunity to comment.

Has any comment been received from stakeholders?

YES	NO
-----	----

If "YES", briefly describe the feedback below (also attach copies of any correspondence to and from the stakeholders to this application):

<p>On 11th September 2009, Electrawinds, the CSIR and the local PE / NMBM FIFA representative, Mr Errol Heynes (Executive Director: NMBM FIFA World Cup) met regarding the power for the stadium in 2010. He said the soccer stadium at PE also has "green goals" and this project would therefore assist in meeting these goals.</p>
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SECTION E: IMPACT ASSESSMENT

The assessment of impacts must adhere to the minimum requirements in the EIA Regulations, 2006, and should take applicable official guidelines into account. The issues raised by interested and affected parties should also be addressed in the assessment of impacts.

1. ISSUES RAISED BY INTERESTED AND AFFECTED PARTIES

List the issues raised by interested and affected parties.

Issues Raised prior to the release of the Draft Basic assessment Report

1. Impacts on Civil Aviation
2. Noise Related Impacts
3. Project Detail Requested
4. Environmental Assessment Process and Public Participation

Issues Raised During the Review of the Draft BAR

5. Potential Impacts on Civil Aviation
6. Avifauna and Bat Related Impacts
7. Visual Impacts of Concern
8. Noise Related Impacts of Concern
9. EIA and Public Participation Issues of Concern
10. Editorial Comments on the Draft BAR
11. General Comments
12. Comments Relating to the Phase 2 Electrawinds Project at Coega

Response from the practitioner to the issues raised by the interested and affected parties (A full response must be given in the Comments and Response Report that must be attached to this report):

For the Comments and Responses Report, see Appendix E.9 in Section F.

2. IMPACTS THAT MAY RESULT FROM THE PLANNING AND DESIGN PHASE

List the potential site alternative related impacts (as appropriate) that are likely to occur as a result of the planning and design phase, including impacts relating to the choice of site alternatives.

Alternative S1 (preferred alternative)

Direct impacts:

(i) Impact on Coega Open Space System (OSS)

The OSS includes areas of sensitive habitat or corridors that are important for ecological reasons. The Electrawinds site is outside the OSS. No impact is predicted from a planning perspective. This was discussed with the Coega ELC on 27 Aug 2009.

A short section of the existing gravel access road passes through a corner of the Coega Open Space Plan (OSP) (refer to map in Appendix A.4 in Section F). This road will be used for access by construction vehicles and the corners will need to be widened to accommodate cranes and other long construction vehicles. This results in very minor loss of area in the OSP (< 200 m²). Given that: (i) the impact is very limited in scale; (ii) the impact occurs along an existing road; and (iii) the impact is on the margins of the OSP, this impact is considered to be of low significance. Furthermore, the potential exists for CDC to refine and consolidate the edges of the OSP in the area between the Electrawinds site and R102 road by expanding the OSP boundary in certain areas.

(ii) Impact on aviation planning and restrictions

The site is situated outside the restricted zone for the PE airport (see Appendix A.6 in Section F). Therefore no impact on aviation planning is identified. However, Electrawinds will still require approval from the Civil Aviation Authority (CAA). Application for approval is already in progress, as Electrawinds have already received the appropriate forms from Lizelle Stroh at the CAA.

(iii) Planning of road access to turbine site

The proposal plan is to use the existing gravel road from the R102 to the Algoa Brick quarry as the access route to the turbine site, with a side extension road of approximately 150 m to be built to the turbine site. This road extension may be less than 150 m as a result of the micro-siting currently

being undertaken to optimise the turbine location. Where this existing road meets the R102 it passes through a corner of the Open Space Plan. Secondly, the road falls within a 500 m wide power line corridor that runs from Dedisa substation in a south-easterly direction towards the coast (refer to cross-hatched area in Figures A.1 and A.4 in Appendix A in Section F). At present, there are power lines on the eastern side of this corridor. Two additional 132 kV lines are planned on the western side of this corridor that would pass above this existing road. The construction date for these lines is uncertain, but it is understood it will be after June 2010 (i.e. after the Electrawinds wind turbine is constructed). When these lines are constructed, they will be 6-7 m above ground. This is high enough to allow vehicular cranes to access the wind turbine site during the operations phase for maintenance purposes. However, if major component replacement was required the height limitation could be a problem. For example, if the nacelle needed to be replaced then a clearance height of 8 m is needed for vehicle access. In this case, a new access road would be required. Options for a new access road were therefore investigated by Afri-Coast Engineers as part of the design phase for this Electrawinds project and discussed with CDC. A better route could not be determined.

It is therefore proposed that the project proceed with using the existing access road off the R102, and if the project planning for the 57.5 MW wind farm does proceed, then the access road to site # 25 (this site for the single turbine) could be integrated into the overall access route planning for the 25 turbine sites that make up the 57.5 MW wind farm.

Indirect impacts:

Cumulative impacts:

Alternative S2

Direct impacts:

Indirect impacts:

Cumulative impacts:

Alternative S3

Direct impacts:

Indirect impacts:

Cumulative impacts:

No-go alternative (compulsory)

Direct impacts:

No benefit of renewable energy (RE) for PE and no opportunity to use the FIFA 2010 soccer to showcase RE at PE.

Indirect impacts:

Cumulative impacts:

Indicate mitigation measures that may eliminate or reduce the potential impacts listed above:

Alternative S1	Alternative S2	Alternative S3
<p>1) Consult with the Coega ELC, CAA and CDC throughout the BA process.</p> <p>2) Work with CDC to refine and consolidate the edges of the Open Space System in the area between the Electrawinds site and R102 road by expanding the OSS boundary in certain areas, to compensate for the minor loss of habitat due to the widening the corners of the existing gravel access road.</p>		

List the potential activity/technology alternative related impacts (as appropriate) that are likely to occur as a result of the planning and design phase:

Alternative A1 (preferred alternative)

Direct impacts:

Indirect impacts:

Cumulative impacts:

Alternative A2

Direct impacts:

Indirect impacts:

Cumulative impacts:

Alternative A3

Direct impacts:

Indirect impacts:

Cumulative impacts:

No-go alternative (compulsory)

Direct impacts:

Indirect impacts:

Cumulative impacts:

Indicate mitigation measures that may eliminate or reduce the potential impacts listed above:

Alternative A1:

Alternative A2:

Alternative A3:

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3. IMPACTS THAT MAY RESULT FROM THE CONSTRUCTION PHASE

List the potential site alternative related impacts (as appropriate) that are likely to occur as a result of the construction phase:

Alternative S1 (preferred alternative)

Direct impacts:

Vegetation Clearing

- **Wind measurement mast:** Vegetation trimming will be required for the lay-down area for the mast as stays. This does not entail the entire removal of the vegetation but the trimming of area of approximately 1600 m² to approximately 10 cm above ground level, so that the mast and stays can be positioned on the ground prior to erection. This vegetation is therefore not totally lost and can re-grow. The vehicles required to access the site during construction can use existing tracks and no access road needs to be constructed.
- **Turbine tower and structure (cabin):** Vegetation clearing will be required to lay the foundations on the site. This vegetative loss is permanent; however, it is intended to replace topsoil and rehabilitate (with local flora) the area around the base of the turbine once it is erected.
- **Access road to wind turbine site:** The current access road to the site needs upgrading to accommodate the transport trucks and a new road needs to be built of approx 150 m long and 5 m wide leading to the site. It is intended to keep this as a gravel road, but the route would have to be cleared of vegetation.
- **Laydown areas for wind turbine:** Hard surface laydown areas are required for the construction equipment, such as cranes. This will also require that vegetation be cleared and compacted gravel surfaces prepared.

The total area to be cleared for this project for permanent features such as foundations, roads and hard standing areas (for cranes during construction and operational maintenance), is approximately 2000 m². Given the limited extent of the impact and the context of the project within the IDZ, the impact significance of vegetation clearing is rated as low.

Water use

Mast: No impact.

Turbine – wash water from concrete use on site: This will be the only process that uses water, with a total volume of 10 m³ of wash water to be generated. Water will be brought in from off-site and used to wash equipment used for casting concrete. Once used, the wash water will be taken away by a recognised waste water contractor. CDC has appointed Veolia Environmental Services (Pty) Ltd to provide this service in the IDZ (see contact details in Section B, 7(b)). Electrawinds could also obtain a quote from a company such as Wastetech for this service. With this mitigation, no impact is predicted.

Noise

Noise generated during the construction phase of the project will mainly be caused by the diesel powered equipment, such as the generators used for powering of equipment, clearing of vegetation, and preparation of the land for laying of the foundations. This noise will be localised and of short duration. Other noise sources include the connection to the power grid. Given the context of the project within the IDZ, the impact significance of construction noise is rated as low.

Visual

NOTE: refer to the Visual specialist study contained in Appendix D (of Section F) for more detailed assessment, maps and illustrations.

Mast: Short term visual impact during construction phase and low level of visibility. Construction of the mast will be visible from the N2 road.

Turbine: The turbine components are very big (e.g. a blade is 50 m long and is transported in one piece). A large crane will be required to lift these components into place. The duration will be very short. Visual exposure is high for a large surrounding area although visual intrusion will be relatively low since the construction will take place among many other developments and construction activities within an industrial area. The visual impact significance from the construction of the turbine is rated as medium, in that the cranes being used and turbine mast itself it will be clearly visible from road users in the area (from the N2 and R102 roads).

Economics

Mast and Turbine: The construction phase is expected to give rise to approximately 100 jobs, mostly drawn from the local population. This impact is rated as positive and of low significance.

Health and Safety

Mast and Turbine: Health and safety is an overarching issue, and applies to both the erection of the mast and construction of the turbine. Workers should be made aware of these issues by receiving training on various aspects of the requirements for the construction process, including health and safety issues, equipment such as stays, safety issues when working at high heights and using cranes, etc. Operators should further be aware that specialised emergency equipment will be needed during erection and maintenance of the turbine. It is important that there are guidelines in place to deal with emergencies, such as a fire in the turbine hub, or someone being hurt during maintenance work on the turbine. With the necessary health and safety requirements in place, this impact is rated as being of low significance.

Transport

The turbine blade is 50 m long and is transported in one piece. Their transport is likely to cause some disruption of traffic on the N2 and R102 and the necessary arrangements must be made with the road authorities. With proper transport planning in place, this impact is rated as being of low significance.

Indirect impacts:

Mast and Turbine: Secondary industries may benefit from this development in the following ways: transport of workers to and from the IDZ; and support services such as concrete suppliers. This impact is rated as positive and of low significance.

Cumulative impacts:

Alternative S2

Direct impacts:

Indirect impacts:

Cumulative impacts:

Alternative S3

Direct impacts:

Indirect impacts:

Cumulative impacts:

No-go alternative (compulsory)

Direct impacts:

Should this project not go ahead, there will be:

- None of the impacts as mentioned, including no loss of vegetation for the turbine, laydown area or

<p>the roads. However, given the project location in an approved IDZ, it is likely that the site would be developed for other purposes.</p> <ul style="list-style-type: none"> ○ No creation of approximately 100 direct jobs during the construction phase, as well as secondary jobs. ○ No visual impact from the erection of the wind turbine and wind monitoring mast. <p>Indirect impacts:</p> <p>No immediate benefits from using the 2010 soccer world cup as an opportunity to promote the NMBM as a leader in renewable energy.</p> <p>Cumulative impacts:</p>

Indicate mitigation measures that may eliminate or reduce the potential impacts listed above:

Alternative S1	Alternative S2	Alternative S3
<p>1. Vegetation Clearing</p> <ul style="list-style-type: none"> (i) For both the turbine and monitoring mast sites, species of special concern must be collected before the commencement of construction. This should be done by Electrawinds in collaboration CDC (e.g. with Linda Redfern who runs a nursery located outside the IDZ on behalf of CDC). These species should be re-established on site as part of the rehabilitation programme. (ii) Top soil from areas to be excavated (e.g. for the foundation of the turbine) must be stored and re-used on site. (iii) Minimise the areas to be cleared of vegetation or where vegetation is to be trimmed. These areas must be clearly specified in the Method Statement that is prepared by Electrawinds prior to construction and demarcated on site (e.g. using hazard tape). (iv) Areas disturbed during construction, such as the area around the base of the wind turbine, must be rehabilitated using plants from the initial search and rescue as well as additional vegetation indigenous to area. (v) At the wind mast site, to create the triangular laydown area for erection of the mast (i.e. lay out of the mast and stays), vegetation must be trimmed to 100 mm above ground level and not removed entirely. (vi) At the wind mast site, the temporary access route for construction must be clearly demarcated with hazard tape to restrict vehicles to this limited area. <p>2. Laydown and Construction Areas</p> <p>These areas must be clearly demarcated using hazardous tape to limit the extent of the impacts.</p> <p>3. Water use</p> <p>Water use for washing the concrete casting equipment should be managed, with dirty wash water stored on site and removed by a waste contractor.</p> <p>4. Road Access</p> <ul style="list-style-type: none"> (i) Widening or extension of existing roads is to be kept to a minimum. (ii) The route to the site should be clearly demarcated (i.e. use hazard tape). (iii) Care should be taken when using the access route so as to prevent further damage to the vegetation. Vehicles should try to stay on the road as far as possible, even when they need to turn around. <p>5. Health and Safety</p> <p>Health and Safety training should be provided to staff involved in the construction phase, particularly for the erection of the mast. Health and safety guidelines should be available during construction and operation.</p> <p>6. Adherence to CDC construction guidelines.</p> <p>7. Exercise of best practice on site.</p> <p>8. Provision of portaloos for workers for the conservation of water and the</p>		

site.		
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List the potential activity/technology alternative related impacts (as appropriate) that are likely to occur as a result of the construction phase:

Alternative A1 (preferred alternative)

<p><i>Direct impacts:</i></p> <p><i>Indirect impacts:</i></p> <p><i>Cumulative impacts:</i></p>

Alternative A2

<p><i>Direct impacts:</i></p> <p><i>Indirect impacts:</i></p> <p><i>Cumulative impacts:</i></p>

Alternative A3

<p><i>Direct impacts:</i></p> <p><i>Indirect impacts:</i></p> <p><i>Cumulative impacts:</i></p>

No-go alternative (compulsory)

<p><i>Direct impacts:</i></p> <p><i>Indirect impacts:</i></p> <p><i>Cumulative impacts:</i></p>

Indicate mitigation measures that may eliminate or reduce the potential impacts listed above:

Alternative A1:	Alternative A2:	Alternative A3:

4. IMPACTS THAT MAY RESULT FROM THE OPERATIONAL PHASE

List the potential site alternative related impacts (as appropriate) that are likely to occur as a result of the operational phase:

Alternative S1 (preferred alternative)

<p><i>Direct impacts:</i></p> <p><u>Visual</u></p> <p><i>Note: The visual impact was considered the most significant impact and a visual specialist report was therefore conducted. The full specialist report is included as Appendix D in Section F</i></p> <p><i>Wind Measuring Mast:</i></p> <p>The wind measuring mast will be 60 m in height (with the top anemometer a further 2 m above the top of the mast, at 62 m height) and could be seen from various views in the IDZ, in particular the N2 national road. The visual impacts must be considered in the context of the IDZ. This piece of equipment will only be there for a short time period, i.e. 12 months, before being taken down again. This impact is therefore short-lived. The visual impact of the wind mast is predicted to be negative and of <u>low</u> significance.</p> <p><i>Wind Turbine:</i></p> <p>The wind turbine, which will be operational for a period of 20 years, will be 100 m tall (from ground to hub height) with three blades each 50 m long. Given the ground level elevation of approximately 59 m and its location on the coastal plateau of the Coega IDZ, it will be visible from within the IDZ and immediate surrounds. It will therefore have an effect on the sense of place of the area. However, the turbine site is in the midst of the IDZ, and as the IDZ develops around the turbine, the turbine will therefore have less effect on the sense of place. The visual specialist predicts that the medium to high visual exposure of the wind turbine will be confined to the IDZ. Other prominent visual features near the turbine site include the existing Eskom Dedisa 400 kV substation and several high capacity power lines that cross the IDZ nearby. A new 132 kV power line corridor is also planned from Dedisa in a south-easterly direction towards the coast. These tall structures give an industrial character to the site, which reduces the effect of the turbine on the sense of</p>

place.

The visual impact on visual receptors has been assessed. Although the turbine will be visible beyond 5km, it is unlikely to be particularly noticeable to the viewers, as it proposed to be white in colour and will generally be viewed against the sky. The most sensitive viewers are considered to be tourists visiting the area, such as visitors to the Greater Addo Elephant National Park (GAENP). Viewers in the GAENP and Colchester area will potentially observe the turbine projecting above the horizon, although it will make up a very small part of the view. Motorists driving along the N2 will experience high visual exposure to the turbine, as they will pass approximately 2.5 km from the turbine. There are many developments underway in the IDZ and at the Port, and views of the wind turbine will include many of these developments. Views from the north (Greater Addo Elephant National Park) will have Port Elizabeth and its various suburbs as backdrop.

The visual impact of a wind turbine is a subjective matter. For some viewers, the turbine could be perceived as a negative impact on the landscape. However, given the location within an industrial zone, and that it indicates progress towards using renewable energy in South Africa, the visual specialist has rated the impact of the turbine as positive. The visual impact of the wind mast is predicted to be positive and of medium significance.

Birds and Bats

Bird species most vulnerable to flying into power lines and other tall structures tend to be the larger and less agile species such as cranes and bustards. When structures such as turbines are located along ridge lines they can also pose a risk to raptors (birds of prey) who make use of the updrafts from the ridges for slope soaring. However, cranes and bustards don't seem to be particularly prone to wind turbine collisions, therefore the collision risk would be relatively low for these species. Furthermore, the Valley Thicket vegetation prevalent in the vicinity of the proposed monitoring mast and turbine is not suitable for these bird species.

The concern with regards to bats is that international studies have shown that the pressure pulses generated by wind turbines can rupture the lungs of bats that fly close to the blades. No ideal natural habitat for bats (e.g. cliffs, caves or large clumps of trees) has been observed in close proximity to the proposed turbine and mast sites. Therefore it is not expected that the project will lead to a high level of bat mortality. (Note: The effect of wind turbines on bat species occurring in South Africa is an area requiring further scientific investigation, in order to be able to provide a more informed assessment. CSIR is embarking on field work and investigations to gather more information on this potential impact, for wind projects in general).

As the development is situated in an industrial area with associated industrial activities, the occurrence of birds and bats is already reduced due to human activities. Therefore, should the turbine result in bird and bat mortalities, it would be lower than that would be expected in a natural environment. Seepage areas, or wetlands, in and around the Coega IDZ might attract water birds.

The scale of the facility will also influence mortality rates. The fact that only one turbine will be developed at this stage reduces the expectance of a high frequency of collisions of birds and bats. The impact of the project on birds and bats is predicted to be of low significance.

It should also be borne in mind that the impact of power lines is a considerably greater threat to birds than wind monitoring masts or turbines. Appendix B.3 in Section F shows a picture of the Dedisa sub-station and associated power lines.

Noise

The wind monitoring mast will not produce any significant noise impacts.

The noise created by the turbine is not expected to cause any major problem, as it is situated in an industrial zone, where there is no residential area in close proximity, and noise levels are generally high. Furthermore, according to SANS 10103: 2008, Table 2, the maximum noise levels for industrial districts should be between 60 and 70 dBA during the day and night respectively. Currently there are no other developments in the immediate vicinity. The closest residential area is approximately 4 km away.

It should also be noted that modern turbines have low noise emissions. The turbines must be well maintained to ensure that the supplier guarantees apply. Well maintained turbines produce less noise. Furthermore, the site is situated in the Coega IDZ and close to two busy roads, i.e. the N2 national road and the R102. Passing traffic will mask the noise of the turbines.

Based on the above factors, the noise impact of the wind turbine is predicted to be of low significance.

Economics

This project will provide 4 permanent posts. It will contribute to the energy requirements of the NMBM and also promote the use of renewable energy in the Eastern Cape. The project is predicted to have a positive impact of low significance.

Heritage

Existing EIAs for the Rezoning of the Coega IDZ have identified features of heritage value. These have been

mapped on the Coega Open Space System (e.g. location of graves). No features of heritage value are shown to occur in the vicinity of the proposed Electrawinds site. If any archaeological or paleontological findings are made during construction (e.g. from excavations), SAHRA and CDC should immediately be notified and a relevant specialist should be consulted. Taking the above in consideration, as well as the very limited footprint of the project, no impact on heritage is predicted.

Indirect impacts:

Health and Safety

Health and safety is an overarching issue, and applies to operational phase of the project, when maintenance is required. Operators should be aware that specialised equipment (e.g. cranes) will be needed during maintenance of the turbine and work will be performed at high heights. Workers must have undergone the necessary safety training. It is important that there are guidelines in place to deal with emergencies, such as someone being hurt during maintenance work on the turbine.

Secondary economic benefits

- Employment of support industries, e.g. maintenance of turbine during its lifecycle;
- Opportunity to promote NMBM as the leader in PE through linking the power to the FIFA 2010 soccer stadium;
- Power generation for NMBM by the 2.3 MW turbine;
- Electrawinds has committed to provide bursaries to individuals who are interested in receiving training and skills development in the field of renewable energy.

Cumulative impacts:

Palm Tree Power has proposed a 300 kV turbine on a 32 m tower in the IDZ (Basic Assessment was completed). The two projects could have a minor cumulative impact, if the Palm Tree project proceeds.

Alternative S2

Direct impacts:

Indirect impacts:

Cumulative impacts:

Alternative S3

Direct impacts:

Indirect impacts:

Cumulative impacts:

No-go alternative (compulsory)

Direct impacts:

Should this project not go ahead, there will be:

- No loss of vegetation for the turbine, laydown area or the roads;
- No visual intrusion;
- No low frequency noise during operation;
- No bursaries for up and coming renewable energy experts;
- No provision of additional wind information (from the monitoring mast) to inform the planning and design for the potential larger scale wind project proposed by Electrawinds;
- No generation of 2.3 MW for the Nelson Mandela Metro; and
- No job creation.

Indirect impacts:

Cumulative impacts:

Indicate mitigation measures that may eliminate or reduce the potential impacts listed above:

Alternative S1

Alternative S2

Alternative S3

In order to minimise the negative aspects and maximise the positive, the following is **recommended**:

- (i) According to the Aviation Act, 1962, Thirteenth Amendment of the Civil Aviation Regulations (CAR's), 1997: "Wind turbines shall be painted bright white to provide maximum daytime conspicuousness.

<p>The colours grey, blue and darker shades of white should be avoided altogether. If such colours have been used, the wind turbines shall be supplemented with daytime lighting, as required." Camouflage colours, even if they were effective as a mitigatory action, can therefore not be used.</p> <p>(ii) Install lighting on the turbine in accordance with Civil Aviation Regulations. Other lighting of the site should be designed to minimise light pollution without compromising safety.</p> <p>(iii) Internal power lines between turbines and connecting the turbines to the grid must be underground (except where power lines cross river gulleys where they may need to be above ground).</p> <p>(iv) Monitoring of bird and bat fatalities must be undertaken for the first year of the project operation, and thereafter revised depending on the outcomes of this initial one year monitoring phase.</p> <p>(v) To lessen the noise effect, good maintenance of equipment is prescribed.</p> <p>(vi) Maximise the local economic opportunities, by appointing local labour forces and training this staff.</p> <p>(vii) Implement the bursary scheme proposed by Electrawinds, and foster training and skills development.</p>		
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List the potential activity/technology alternative related impacts (as appropriate) that are likely to occur as a result of the operational phase:

Alternative A1 (preferred alternative)

<i>Direct impacts:</i>
<i>Indirect impacts:</i>
<i>Cumulative impacts:</i>

Alternative A2

<i>Direct impacts:</i>
<i>Indirect impacts:</i>
<i>Cumulative impacts:</i>

Alternative A3

<i>Direct impacts:</i>
<i>Indirect impacts:</i>
<i>Cumulative impacts:</i>

No-go alternative (compulsory)

<i>Direct impacts:</i>
<i>Indirect impacts:</i>
<i>Cumulative impacts:</i>

Indicate mitigation measures that may eliminate or reduce the potential impacts listed above:

Alternative A1	Alternative A2	Alternative A3

5. IMPACTS THAT MAY RESULT FROM THE DECOMMISSIONING AND CLOSURE PHASE

List the potential site alternative related impacts (as appropriate) that are likely to occur as a result of the decommissioning or closure phase:

Alternative S1 (preferred alternative)

<i>Direct impacts:</i>
<i>Wind Measuring Mast:</i>

The mast will only be up for 12 months, after which it can be disassembled. It can however be reassembled and re-used at another site.

Wind Turbine:

The lifetime of the turbine is predicted to be 20 years but is dependent on the maintenance programme implemented and the development of new technology.

The key residual impacts from the turbine are:

- (i) The tower base (concrete base of 15m x 15m).
- (ii) Gravel access road to the turbine site (approximately 150 m long x 5 m wide)
- (iii) The hard standing area at the turbine site for the crane used during construction and for possible maintenance during operations (this is a gravel base of approx 45 m x 9 m = 405 m²).

Indirect impacts:

Cumulative impacts:

Alternative S2

Direct impacts:

Indirect impacts:

Cumulative impacts:

Alternative S3

Direct impacts:

Indirect impacts:

Cumulative impacts:

No-go alternative (compulsory)

Direct impacts:

If this project does not go ahead there will be no need to decommission the project.

Indirect impacts:

Cumulative impacts:

Indicate mitigation measures that may eliminate or reduce the potential impacts listed above:

Alternative S1	Alternative S2	Alternative S3

List the potential activity/technology alternative related impacts (as appropriate) that are likely to occur as a result of the decommissioning and closure phase:

Alternative A1 (preferred alternative)

Direct impacts:

Indirect impacts:

Cumulative impacts:

Alternative A2

Direct impacts:

Indirect impacts:

Cumulative impacts:

Alternative A3

Direct impacts:

Indirect impacts:

Cumulative impacts:

No-go alternative (compulsory)

<p><i>Direct impacts:</i></p> <p><i>Indirect impacts:</i></p> <p><i>Cumulative impacts:</i></p>

Indicate mitigation measures that may eliminate or reduce the potential impacts listed above:

Alternative A1	Alternative A2	Alternative A3

6. PROPOSED MANAGEMENT OF IMPACTS AND MITIGATION

Indicate how identified impacts and mitigation will be monitored and/or audited.

Alternative S1	Alternative S2	Alternative S3
<p><u>DESIGN PHASE</u></p> <ul style="list-style-type: none"> ○ Turbine colour should be white, as per the South African Civil Aviation Regulations of 1997. This colour is also preferable in terms of minimising the visual impact. ○ Electrawinds to complete the approval process required by the Civil Aviation Authority (CAA) for the turbine and mast. ○ For access to the turbine site, use the existing gravel road leading off the R102. However, if the project planning for the 57.5 MW wind farm proceeds, then the access road to site # 25 (this site for the single turbine) could be integrated into the overall access route planning for the 25 turbine sites that make up the 57.5 MW wind farm. ○ Collaborate with CDC to refine and consolidate the edges of the Coega Open Space System (OSS) in the area between the Electrawinds site and R102 road by expanding the OSS boundary in certain areas. The aim is to ensure that the area of the OSS that is lost due to the widening of the corners of the existing access road is offset by the increased area from refining the OSS boundary (i.e. no net loss of OSS). <p><u>CONSTRUCTION PHASE</u></p> <p>(i) <u>Environmental management during construction</u></p> <ul style="list-style-type: none"> ○ Appoint an Environmental Control Officer (ECO) to oversee the construction phase. This may not be a full time appointment, but would require regular (e.g. weekly) site visits and inspections by the ECO, with reports provided to CDC. ○ Prepare Method Statements for the site preparation and construction phase. These must be checked and approved by CDC prior to construction. <p>(ii) <u>Clearing of vegetation and maintenance of natural habitat</u></p> <ul style="list-style-type: none"> ○ For both the turbine and monitoring mast sites, species of special concern must be collected before the commencement of construction. This should be done by Electrawinds in collaboration CDC (e.g. with Linda Redfern who runs a nursery outside the IDZ on behalf of CDC). These species should be re-established on site as part of the rehabilitation programme. ○ Top soil from areas to be excavated (e.g. for the foundation of the turbine) must be stored and re-used on site. ○ Minimise the areas to be cleared of vegetation or where vegetation is to be trimmed. These areas must be clearly specified in the Method Statement that is prepared by Electrawinds prior to construction and demarcated on site (e.g. using hazard tape). ○ Areas disturbed during construction, such as the area around the base of the wind turbine, must be rehabilitated using plants from the initial search and rescue as well as additional vegetation indigenous to area. ○ At the wind mast site, to create the triangular laydown area for erection of the mast (i.e. lay out of the mast and stays), vegetation must be trimmed to 100 mm above ground level and not removed entirely. ○ At the wind mast site, the temporary access route for construction must be clearly demarcated with hazard tape to restrict vehicles to this limited area. ○ Ensure that the storage and operation of construction equipment and activities of personnel are contained within the designated work areas. 		

<ul style="list-style-type: none"> ○ Avoid soil erosion within and in the vicinity of the construction area. <p>(iii) <u>Road access to site</u></p> <ul style="list-style-type: none"> ○ Widening or extension of existing roads is to be kept to a minimum. ○ The route to the site should be clearly demarcated (i.e. use hazard tape). ○ Care should be taken when using the access route so as to prevent further damage to the vegetation. Vehicles should try to stay on the road as far as possible, even when they need to turn around. <p>(iv) <u>Soil and Groundwater</u></p> <ul style="list-style-type: none"> ○ Prevent the spillage of fuel, oil or grease on site and remedy this should it occur. ○ Prevent spillage of cement, sand and stone into soil and vegetation beyond the defined area for concrete mixing and batching. ○ Water use for washing the concrete casting equipment must be closely managed, with dirty wash water (estimated to be a maximum of 10 m³) to be stored on site (e.g. in plastic tanks or lined temporary ponds) and removed by a waste contractor. <p>(v) <u>Visual</u></p> <ul style="list-style-type: none"> ○ Minimise visual impact during the construction phase. ○ Minimise contrast with surrounding environment and visibility of the turbines and masts to humans. <p>(vi) <u>Aviation</u></p> <ul style="list-style-type: none"> ○ Ensure that the facility complies with Civil Aviation Authority requirements for turbine and mast visibility to aircraft, i.e. red pulsating light on the turbine tower and wind monitoring mast. ○ Colour of turbines to be white to minimize aircraft collision risks and comply with the Civil Aviation Regulations of 1997³. <p>(vii) <u>Birds</u></p> <ul style="list-style-type: none"> ○ Power lines connecting the turbine to grid must be below ground, except where the line cross a gully and water erosion risks require that it is above ground. <p>(viii) <u>Site management</u></p> <ul style="list-style-type: none"> ○ Ensure that wastes are managed in an environmentally friendly manner. ○ Provision of portaloos for workers on site. ○ Adherence to CDC construction guidelines. <p>(ix) <u>Health and safety</u></p> <ul style="list-style-type: none"> ○ Health and Safety training should be provided to staff involved in the construction phase, particularly for workers operating at high heights. Health and safety guidelines must be available during construction. <p>OPERATIONAL PHASE</p> <p>(i) <u>Compliance with Civil Aviation Regulations</u></p> <ul style="list-style-type: none"> ○ According to the Aviation Act, 1962, Thirteenth Amendment of the Civil Aviation Regulations (CAR's), 1997: "Wind turbines shall be painted bright white to provide maximum daytime conspicuousness. The colours grey, blue and darker shades of white should be avoided altogether. If such colours have been used, the wind turbines shall be supplemented with daytime lighting, as required." Camouflage, even if it were effective as a mitigatory action, can therefore not be used. 		
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³ According to the Aviation Act, 1962, Thirteenth Amendment of the Civil Aviation Regulations (CAR's), 1997: "Wind turbines shall be painted bright white to provide maximum daytime conspicuousness. The colours grey, blue and darker shades of white should be avoided altogether. If such colours have been used, the wind turbines shall be supplemented with daytime lighting, as required." Camouflage, even if it were effective as a mitigatory measure (see Gipe 1995 and Stanton 1996), can therefore not be used.

<ul style="list-style-type: none"> ○ Install lighting on the turbine in accordance with Civil Aviation Regulations. Other lighting of the site should be designed to minimise light pollution without compromising safety. <p>(ii) <u>Monitor for any evidence of bird and bat collisions</u></p> <ul style="list-style-type: none"> ○ The potential for Bird Flight Diverters (BFDs) to be installed on the guy wires of the monitoring mast was considered at the time of preparing the Draft BA Report. However, subsequent ornithological inputs indicate that this is not necessary, given the type of habitat and bird species prevalent in the area. ○ Monitoring of bird and bat fatalities must be undertaken for the first year of the project operation, and thereafter revised depending on the outcomes of this initial one year monitoring phase. <p>(iii) <u>Minimize noise impacts</u></p> <ul style="list-style-type: none"> ○ To lessen the noise effect, good maintenance of equipment is prescribed. ○ Monitor the noise around the single turbine during day time and night time, under a range of wind speeds, to obtain empirical data at Coega on the noise impacts and to verify the predicted noise impact. <p>(iv) <u>Maximise local employment</u></p> <ul style="list-style-type: none"> ○ Maximise the local economic opportunities, by appointing local labour forces and training this staff. <p>(v) <u>Provide a bursary scheme</u></p> <ul style="list-style-type: none"> ○ Implement the bursary scheme proposed by Electrawinds, and foster training and skills development. <p><u>DECOMMISSIONING PHASE</u></p> <ul style="list-style-type: none"> ○ Return the area in its original state, noting that it is reasonable to expect that below ground foundations would remain. 		
Alternative A1	Alternative A2	Alternative A3

7. ENVIRONMENTAL IMPACT STATEMENT

Taking the assessment of potential impacts into account, please provide an environmental impact statement that sums up the impact that the proposed activity and its alternatives may have on the environment after the management and mitigation of impacts have been taken into account with specific reference to types of impact, duration of impacts, likelihood of potential impacts actually occurring and the significance of impacts.

Alternative S1 (preferred alternative)

The main positive and negative impacts are summarised below:

Sourcing of wind data and promotion of wind energy

Although the actual generation capacity of the single turbine is small (2.3 MW), it will demonstrate tangible progress towards the development of renewable energy sources for the Nelson Mandela Bay Municipality (NMBM). The project could showcase the NMBM as a leader in renewable energy, for example, during the 2010 FIFA World Cup. The effect of the project in promoting the use of wind energy is predicted to have a positive impact of low significance.

Visual impact and effect on "sense of place"

The wind turbine, which will be operational for a period of 20 years, will be 100 m tall (from ground to hub height) with three blades each 50 m long. Given its location on the coastal plateau of the Coega IDZ, it will be visible from within the IDZ and immediate surrounds. It will therefore have an effect on the sense of place of the area. However, the turbine site is in the midst of the IDZ, and as the IDZ develops around the turbine, the turbine will have less effect on the sense of place. Other prominent features near the turbine site, such as the Eskom Dedisa 400 kV substation and several high capacity power lines that cross the IDZ nearby, already give the area an industrial character. It is recognised that the visual impact of a wind turbine is a subjective matter. Given the location of the turbine within an industrial zone, and that it indicates progress towards using renewable energy in South Africa, the visual impact is predicted to be positive and of medium significance.

Impact of vegetation clearing and habitat loss

The project requires clearing of an area of approximately 2000 m² for permanent features such as foundations, roads and hard standing areas for cranes. This impact would be for the duration of the project, which is a minimum of 20 years. In addition, for the wind monitoring mast an area of approximately 1600 m² needs to have vegetation trimmed to a height of 10 cm above ground in order to lay out the mast and stays prior to erection. The sites for the wind turbine and monitoring mast are both outside of the Coega Open Space System. Prior to construction, any species of special concern should be collected and placed in a nursery. Given the above factors and the context of the project within an IDZ, the negative impact of the project on habitat loss is of low significance.

Impacts on birds

It is recommended that bird anti-collision devices be placed on the stays of the monitoring mast, which is operational for 12 months. Given this recommendation, and that larger birds tend to avoid turbines, the negative impact of the project on birds is predicted to be of low significance.

Concluding statement

It is the opinion of the environmental practitioner that mitigation measures to avoid or reduce negative impacts have been adequately investigated. Provided that the recommended management actions are implemented effectively, the proposed wind monitoring mast and single turbine are assessed to provide a net positive contribution to sustainability.

Alternative S2

Alternative S3

No-go alternative (compulsory)

8. RECOMMENDATION OF PRACTITIONER

Is the information contained in this report and the documentation attached hereto sufficient to make a decision in respect of the activity applied for (in the view of the environmental assessment practitioner).

YES	NO
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If "NO", indicate the aspects that should be assessed further as part of a Scoping and EIA process before a decision can be made (list the aspects that require further assessment):

Not applicable.

If "YES", please list any recommended conditions, including mitigation measures, that should be considered for inclusion in any authorisation that may be granted by the competent authority in respect of the application:

Refer to the management actions and monitoring requirements listed in Section 6 for the design, construction, operations and decommissioning phases of the proposed project.

SECTION F: APPENDICES

The following appendices are attached as appropriate:

Appendix A: Site layout plans

- A.1: Site Plan for Electrawinds Wind Measuring Mast and Wind Turbine
- A.2: Construction layout of the Monitoring Mast
- A.3: Operational layout for wind monitoring mast
- A.4: Construction of Coega wind turbine
- A.5: Construction of Coega wind turbine without the background
- A.6: Civil Aviation Authority Air Space Requirements
- A.7: Port Elizabeth Airport Airspace

Appendix B: Photographs

- B.1 Photographs taken in 8 compass directions from the centre of the site for the wind turbine
- B.2 Photographs taken in 8 compass directions from the centre of the site for the wind monitoring mast
- B.3 Photograph of the Dedisa substation located north of the wind turbine site

Appendix C: Facility illustrations

Appendix D: Specialist report – Visual Impact Assessment

Appendix E: Public Consultation

- E.1 E-Notice Board at Coega offices
- E.2 Register of I&APs for the Electrawinds Basic Assessment process
- E.3 Letter 1 to I&APs
- E.4 Advertisement in The Herald newspaper (28 August 2009)
- E.5 Issues Raised by I&APs prior to the release of the Draft Basic Assessment Report
- E.6 Comments received from I&APs prior to release of the Draft Basic Assessment report
- E.7 Correspondence sent to I&APs on the review of the Draft Basic Assessment Report
- E.8 Comments on the Draft Basic Assessment Report received from I&APs
- E.9 Comments and Responses Report for the Draft Basic Assessment Report

**Appendix F: Information in support of applications for exemption
(not applicable)**

Appendix G: Other information

- G.1 "Letter of consent" from CDC for use of the proposed site
- G.2 Notice of Intent submitted by CSIR (17/09/2009) to DEAT
- G.3 Letter from DEAT (25/09/2009) acknowledging the Notice of Intent

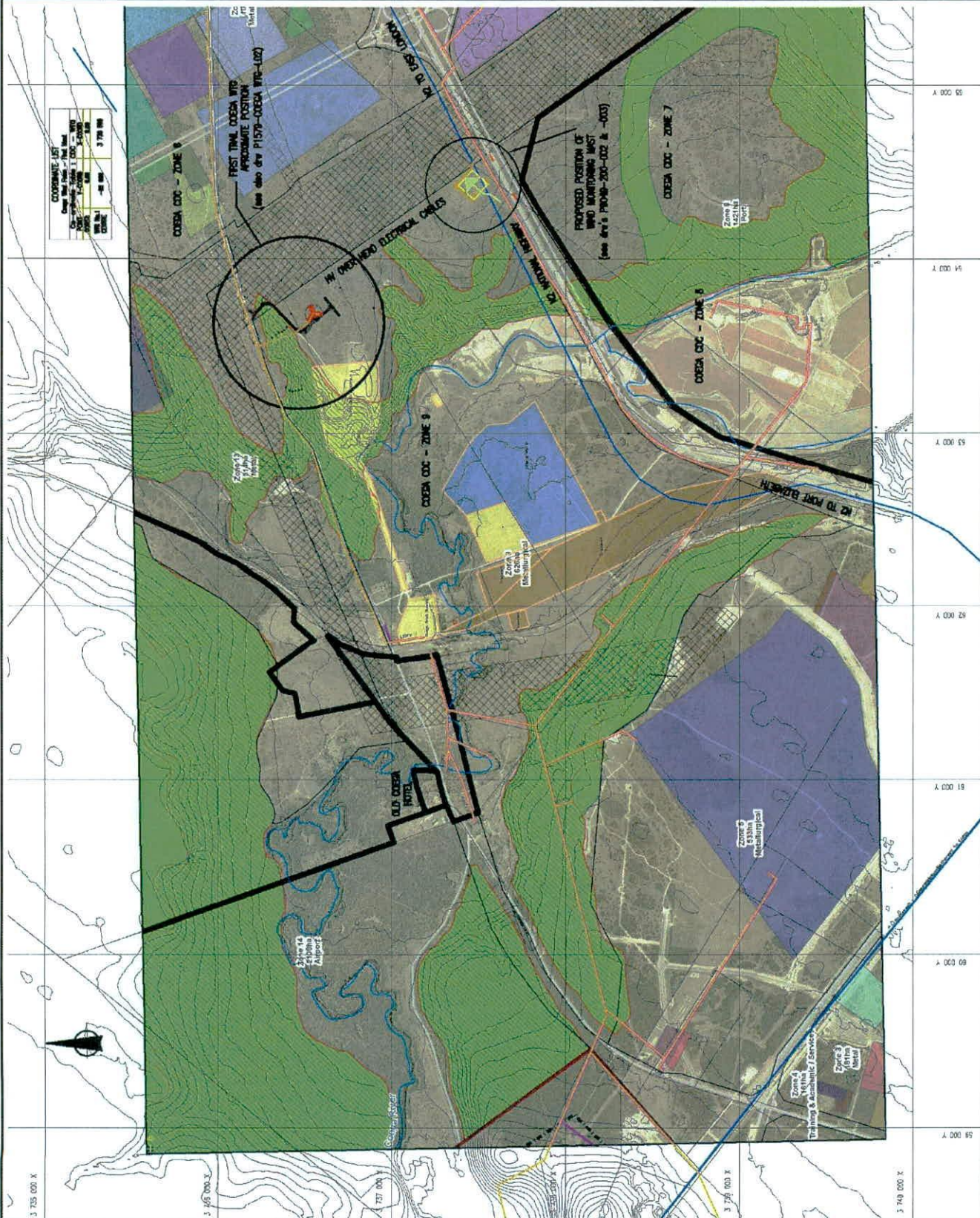
APPENDIX A

Site Plans & Facility Illustrations

Figure A.1: Site Plan for Electrawinds Wind Measuring Mast and Wind Turbine _____	4
Figure A.2: Construction layout of the Electrawinds Wind Monitoring Mast _____	5
Figure A.3: Operational layout for wind monitoring mast _____	6
Figure A.4: Construction of Coega wind turbine _____	7
Figure A.5: Construction layout for the Electrawinds wind turbine _____	8
Figure A.6: Civil Aviation Authority air space requirements _____	9
Figure A.7: Port Elizabeth Airport Airspace _____	10

- GENERAL NOTES**
1. THE DRAWING SHOWS ONLY A GENERAL LAYOUT FOR SUPPORT TO THE ENGINEERING PROFESSION. SUPPORT TO THE ENGINEERING PROFESSION IS THE RESPONSIBILITY OF THE ENGINEER.
 2. THE DRAWING IS NOT TO BE USED FOR CONSTRUCTION OF ANY STRUCTURE WITHOUT THE APPROVAL OF THE ENGINEER.
 3. ALL DIMENSIONS ARE TO THE CENTERLINE UNLESS OTHERWISE NOTED.
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 10. ALL DIMENSIONS ARE TO THE CENTERLINE UNLESS OTHERWISE NOTED.

Figure A.1:
 Site Plan for
 Electrawinds
 Wind
 Measuring
 Mast and
 Wind Turbine



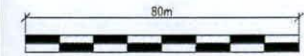
PROJECT NO.	1
DATE	15/10/2009
SCALE	1:1000
PROJECT NAME	ELECTRAWINDS
CLIENT	AE
DESIGNER	AE
CHECKER	AE
DATE	15/10/2009

GENERAL NOTES

1. -

Figure A.2:

Construction layout of the
Electrawinds Wind
Monitoring Mast



FILE NAME: P
PLOT STYLE: a3-plot.ctb
PLOT SCALE: 1:1
PAPER SIZE: A2

NO.	DATE	REVISION	DATE
1		PRELIMINARY	

PROJECT DIRECTOR: _____ DATE: _____

PROJECT MANAGER: _____ DATE: _____

AE
AFRI-COAST
ENGINEERS
100-1000 Engineers & 370 Ltd - 2004

Car: Ross/Morelock Street
Central, Port Elizabeth, 6001
PO Box 5104
Waverley, 6005

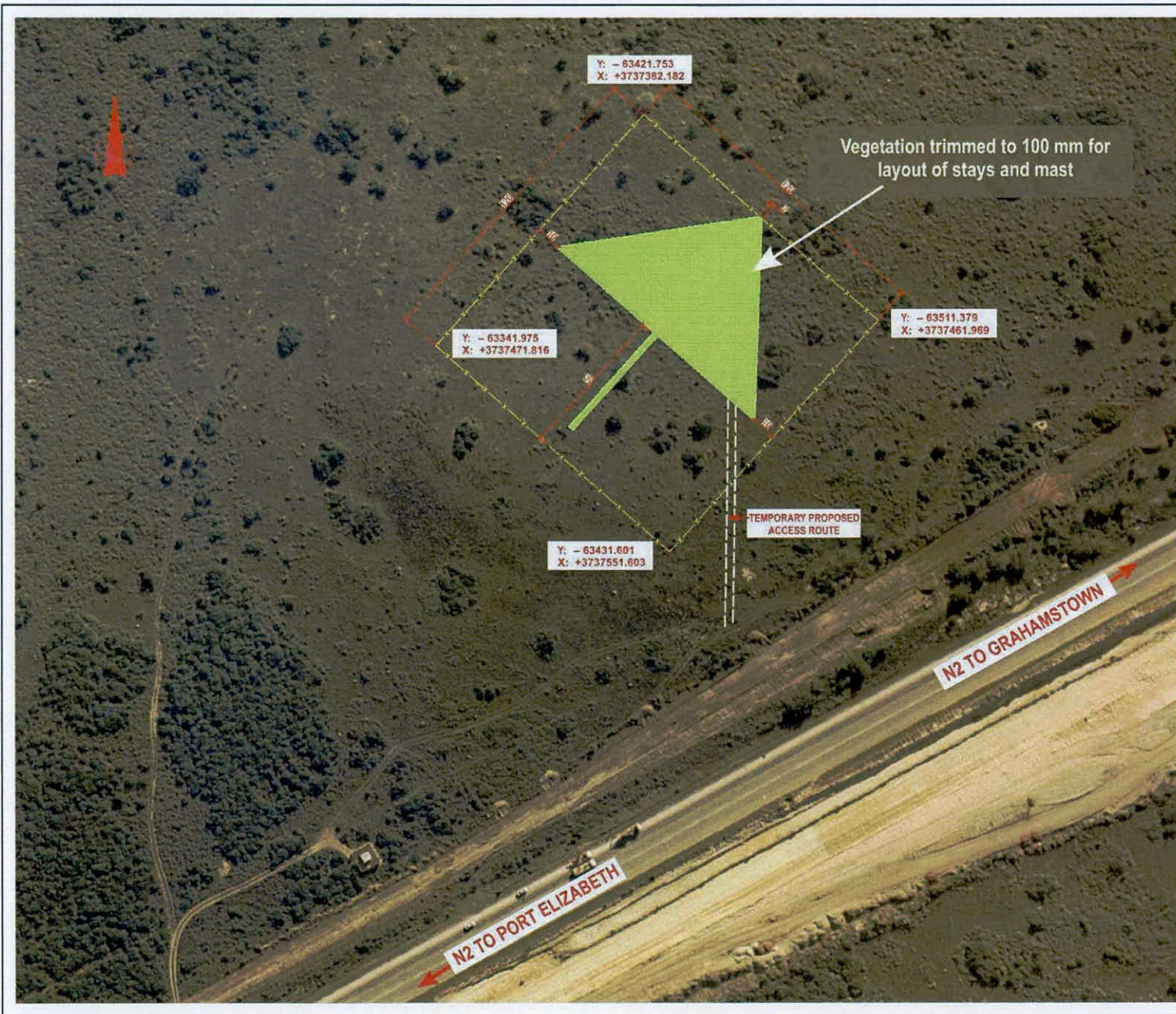
Tel: +27 (41) 505-8900
Fax: +27 (41) 505-3437
info@afri-coast.com

CLIENT:
ELECTRAWINDS

PROJECT:
**ELECTRAWINDS TURBINE AND
MEASURING MAST**

TITLE:
**CONSTRUCTION LAYOUT OF
WIND MEASURING MAST**

STATUS:	PRELIMINARY	SCALE:	1:1000
DRAWING No:	P9049-200-002	REVISION:	0



GENERAL NOTES

1. -

Figure A.3:

Operational layout of the
Electrawinds Wind
Monitoring Mast



FILE NAME: P
PLOT STYLE: std-plot.ctb
PLOT SCALE: 1:1
PAPER SIZE: A2

1	PRELIMINARY	---	---
NL	DRAWN	REVISION	DATE
DESIGNED			---
CHECKED			

PROJECT DIRECTOR:

DATE

PROJECT MANAGER:

DATE

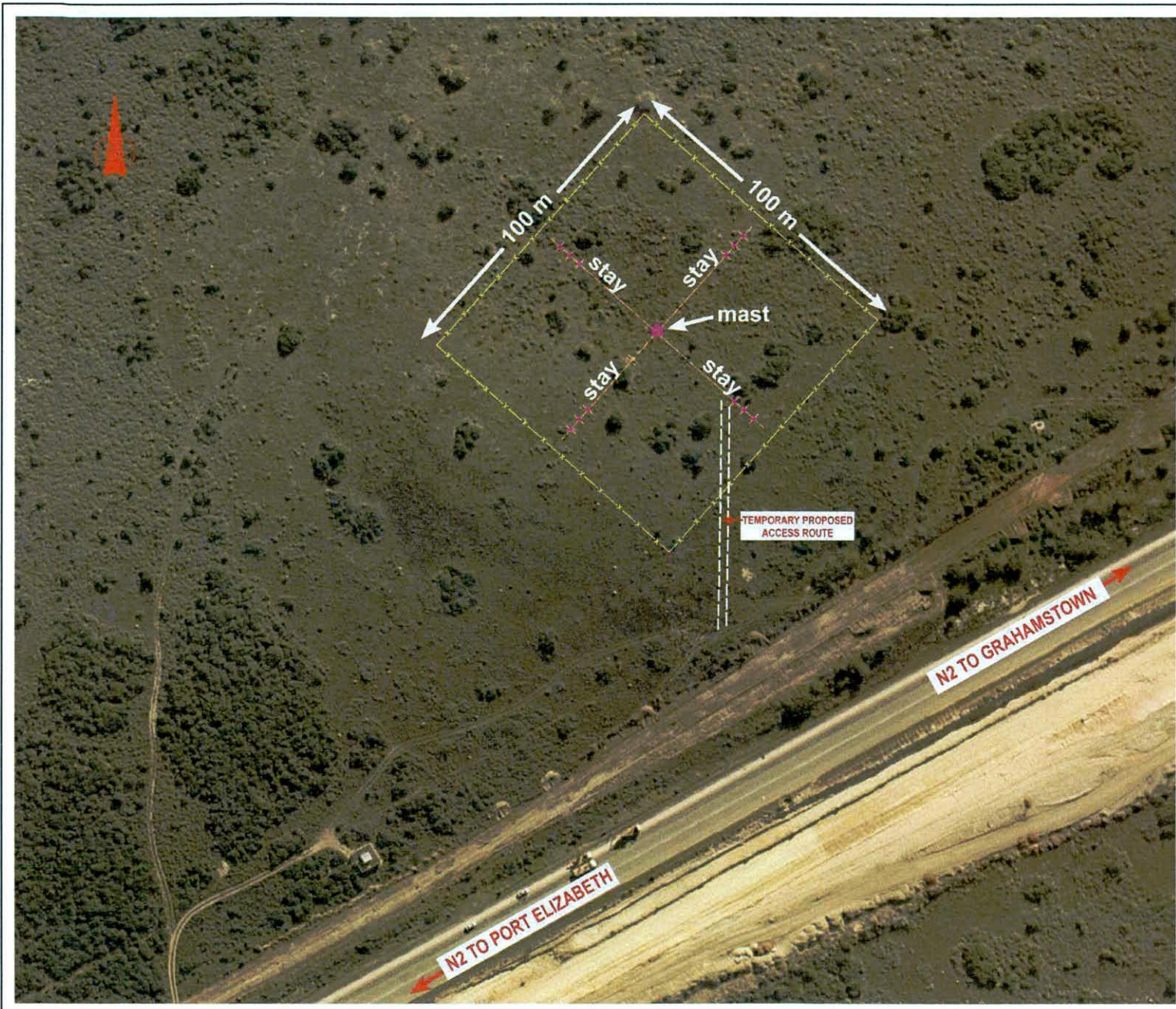
AE
AFRI-COAST ENGINEERS
110 Blue 5104
Wahner 5095
Tel: +27 (41) 505-8000
Fax: +27 (41) 585-5437
info@afri-coast.com

CLIENT:
ELECTRAWINDS

PROJECT:
**ELECTRAWINDS TURBINE AND
MEASURING MAST**

TITLE:
**OPERATIONS LAYOUT OF
WIND MEASURING MAST**

STATUS:	PRELIMINARY	SCALE:	1:1000
DRAWING No:	P9049-200-003	REVISION:	0



GENERAL NOTES

1. THE DRAWING SETS SHALL BE GENERAL LAYOUT FOR PROPOSED WIND TURBINE AND MAST. THE PROPOSED WIND TURBINE AND MAST SHALL BE SUBJECT TO APPROVAL BY THE LOCAL PLANNING BOARD. REVISIONS TO THIS DRAWING SHALL BE SUBJECT TO APPROVAL BY THE LOCAL PLANNING BOARD.
2. THIS DRAWING ONLY INCLUDES THE PROPOSED WIND TURBINE AND MAST. THE PROPOSED WIND TURBINE AND MAST SHALL BE SUBJECT TO APPROVAL BY THE LOCAL PLANNING BOARD.
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10. THE PROPOSED WIND TURBINE AND MAST SHALL BE SUBJECT TO APPROVAL BY THE LOCAL PLANNING BOARD.

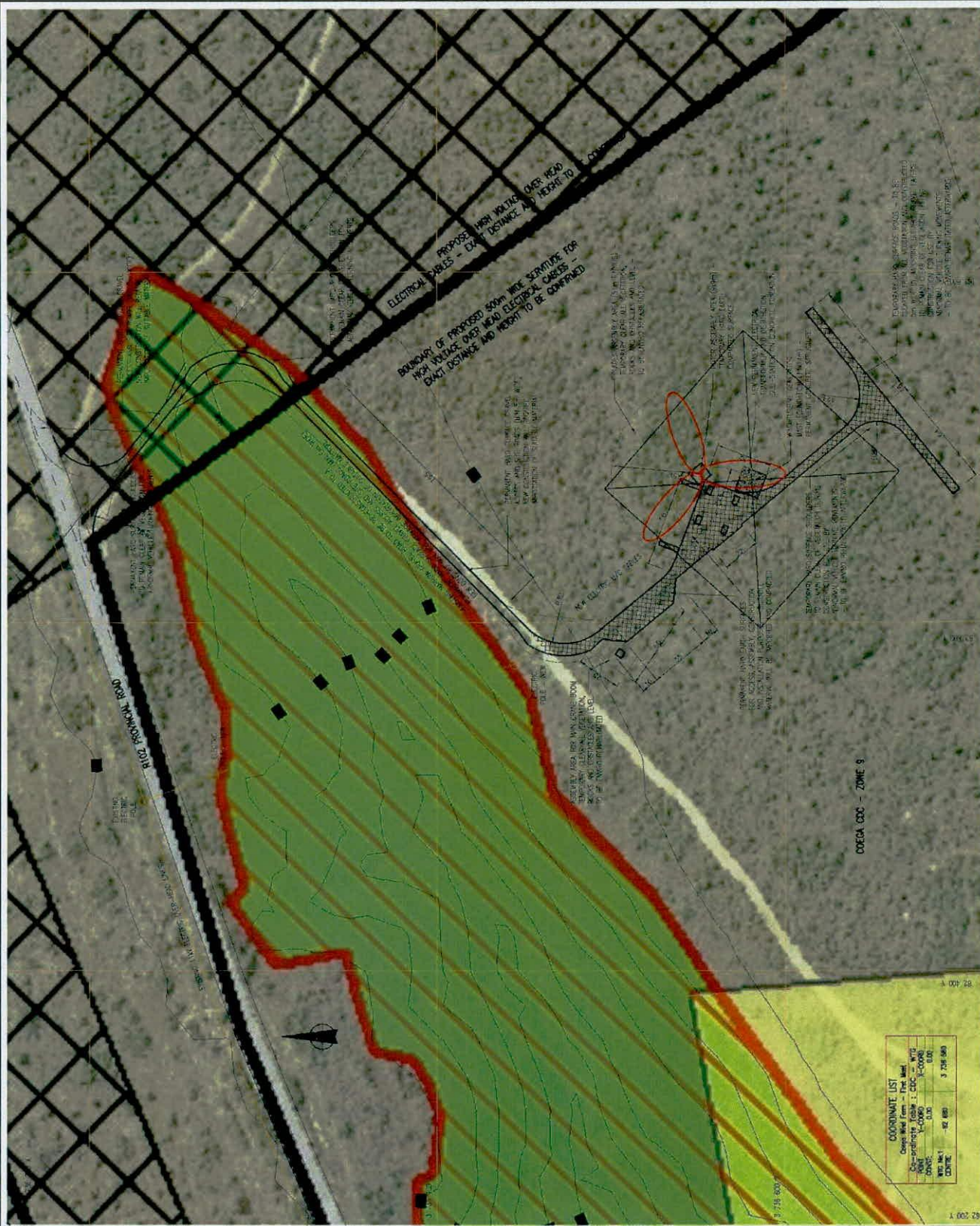
Figure A.4:
Construction of
Coega wind
turbine

NO.	DATE	DESCRIPTION	BY	CHKD
1	11/11/2011	ISSUED FOR PERMITTING	AE	AE
2	11/11/2011	ISSUED FOR PERMITTING	AE	AE
3	11/11/2011	ISSUED FOR PERMITTING	AE	AE
4	11/11/2011	ISSUED FOR PERMITTING	AE	AE
5	11/11/2011	ISSUED FOR PERMITTING	AE	AE
6	11/11/2011	ISSUED FOR PERMITTING	AE	AE
7	11/11/2011	ISSUED FOR PERMITTING	AE	AE
8	11/11/2011	ISSUED FOR PERMITTING	AE	AE
9	11/11/2011	ISSUED FOR PERMITTING	AE	AE
10	11/11/2011	ISSUED FOR PERMITTING	AE	AE

AE
AERIAL-COAST
INCORPORATED
1000 W. 10th Street
Anchorage, Alaska 99501
Tel: 907.561.4400
Fax: 907.561.4401
www.aerial-coast.com

ELECTRIMANDS
CONSTRUCTION OF ELECTRIMANDS
TURBINE AND MEASURING MAST
AT COEGA DZ

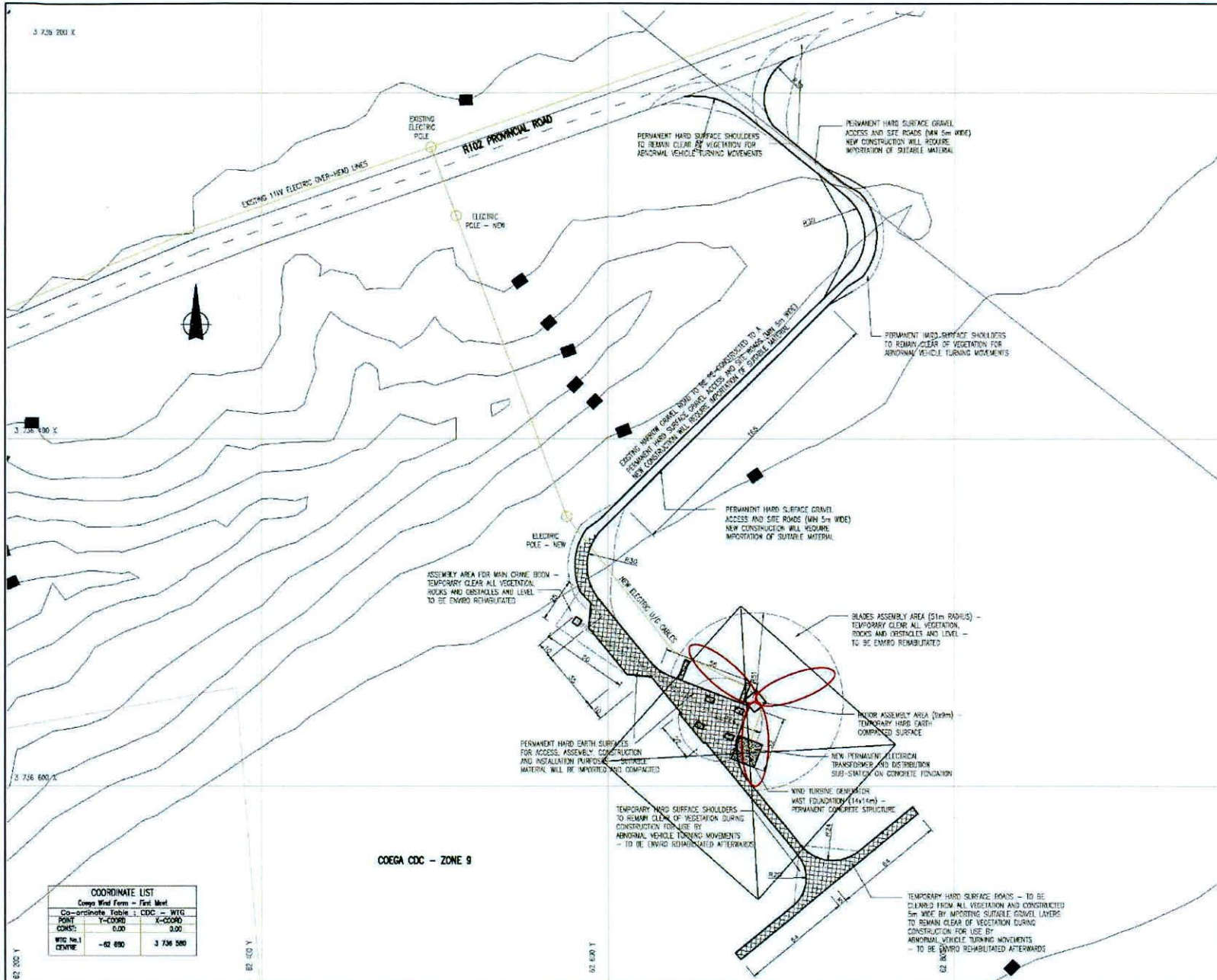
PROJECT NO.	11-000
DATE	11/11/2011
SCALE	AS SHOWN
DATE	11/11/2011



COORDINATE LIST

POINT	X (Easting)	Y (Northing)
1	42,000	3,718,000
2	42,000	3,718,000
3	42,000	3,718,000
4	42,000	3,718,000

CONSTRUCTION OF ELECTRIMANDS
TURBINE AND MEASURING MAST
AT COEGA DZ



3 726 200 X

3 736 400 X

3 736 600 X

62 600 Y

62 630 Y

62 600 Y

COEGA CDC - ZONE 9

Comp Wind Farm - First Mast			
Co-ordinate Table 1 CDC - WTG			
NORTH	E-COORD	X-COORD	
CONST:	0.00	0.00	
WTG No.1			
CENTRE	-62 690	3 736 500	

- GENERAL NOTES**
1. THIS DRAWING COMES ONLY AS GENERAL LAYOUT FOR SUPPORT TO THE BASIC ENVIRONMENTAL ASSESSMENT REPORT AS APPLICATION FOR PROJECT PLANNING STAGE.
 2. THIS DRAWING ONLY INDICATES THE PROPOSED BASIC INFRASTRUCTURE REQUIRED FOR THE FIRST OF A SERIES OF WIND TOWER CONSTRUCTION PLANNED FOR THE GOLDEN REGION.
 3. FINAL DESIGN AND CONSTRUCTION COSTS AND PROPOSED ROAD WORK TO BE DONE BY THE DEVELOPER - NOT PART OF THIS APPLICATION.
 4. ALL OPERATIONS AND WORKING ARE PROHIBITED AND MAY CAUSE AN ENVIRONMENTAL CONCESSION AS FOR REQUIREMENTS FOLLOWING FROM THE EA APPLICATION.
 5. NOTE THAT CURRENTLY NO WIND TOWER OR ROADS ARE CURRENTLY BEING CONSTRUCTED OR PLANNED IN THIS AREA.
 6. NO PROPOSED WIND TOWER OR ROADS EXIST NEAR THE AREA. ALL WIND TOWER WILL BE PROPOSED AND NO ROADWORKS EXIST IN THIS AREA.
 7. CHECKS EXIST ALONG THE PROPOSED ROAD AND FARM PROPERTIES, IDENTIFYING THE CATASTROPHIC ROADSIDES.
 8. NO CULTURAL OR HISTORICAL FEATURES / MONUMENTS EXIST NEAR THIS AREA.
 9. NO LARGE TREES OR SHRUBS EXIST IN THE AREAS WHERE VEGETATION CLEARANCE ARE PROPOSED.

Figure A.5:
Construction layout for the Electrawinds wind turbine

As per CD ORIGINAL DRAWING

FILE NAME: WIND-TOWER-WD-01A
JOB NO: WIND-01A
JOB TITLE: EA
PROJECT NO: 12

NO.	DESCRIPTION	REVISION	DATE

PREPARED BY:	DATE:
CHECKED BY:	DATE:
APPROVED BY:	DATE:

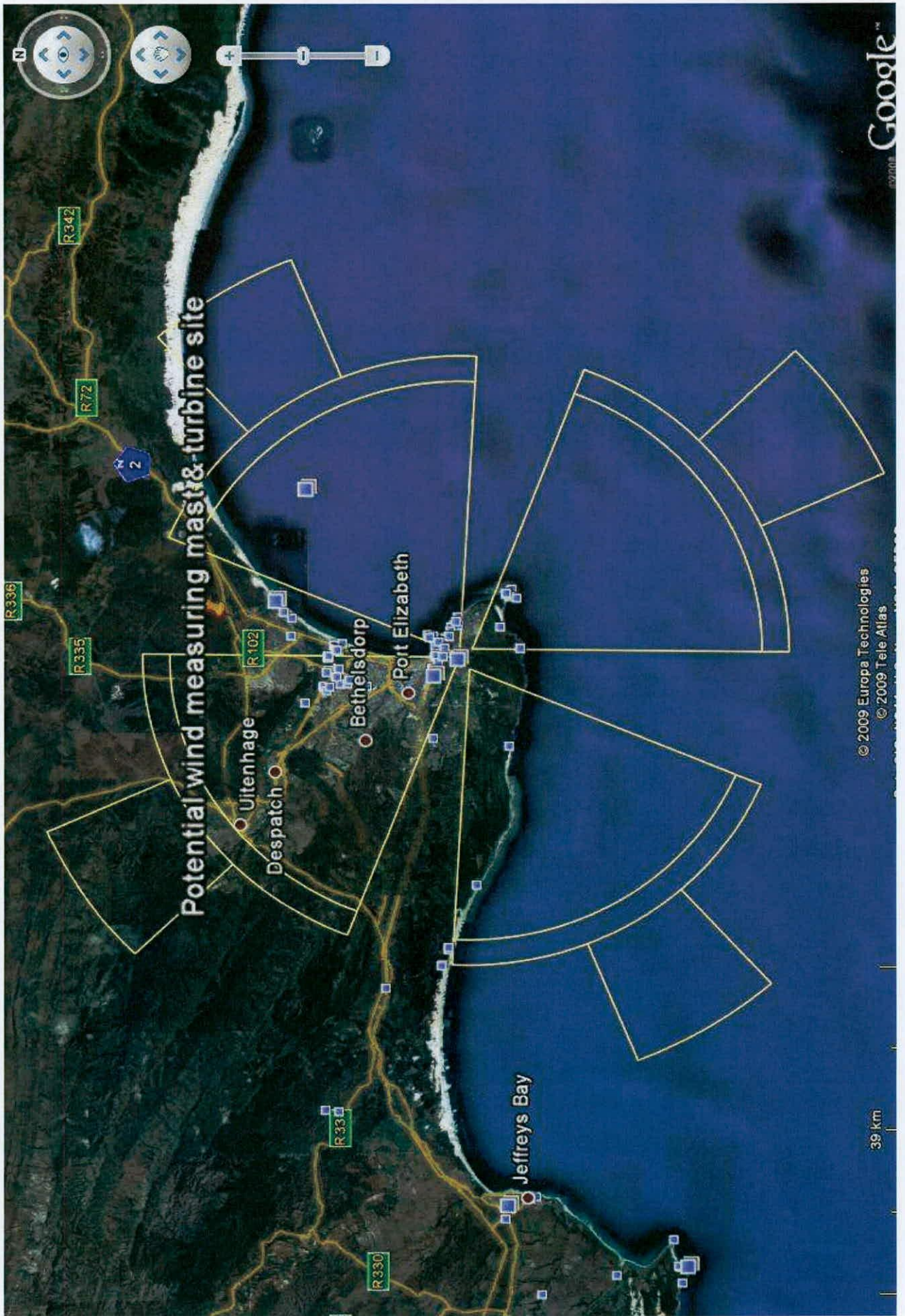
AE AFRICOAST ENGINEERS	Dr. Abu Dohier, Director General Tel: 00253 21 2121 Fax: 00253 21 2121 Mobile: 00253 99 515 515
	Sir. Abdullatif A. Al-Sayid Tel: 00253 21 2121 Fax: 00253 21 2121 Mobile: 00253 99 515 515

ELECTRAWINDS

CONSTRUCTION OF ELECTRAWINDS TURBINE AND MEASURING MAST AT COEGA IDC

PROPOSED DETAIL LAYOUT FIRST TRIBAL WIND TURBINE AND MAST; PROPOSED POSITION AND BASIC ROAD LAYOUT OF CONSTRUCTION AREA

DATE: EA BASIC ASSESSMENT REPORT 1/11/2009
DRAWING NO: P9049-200-004
PAGE NO: 3



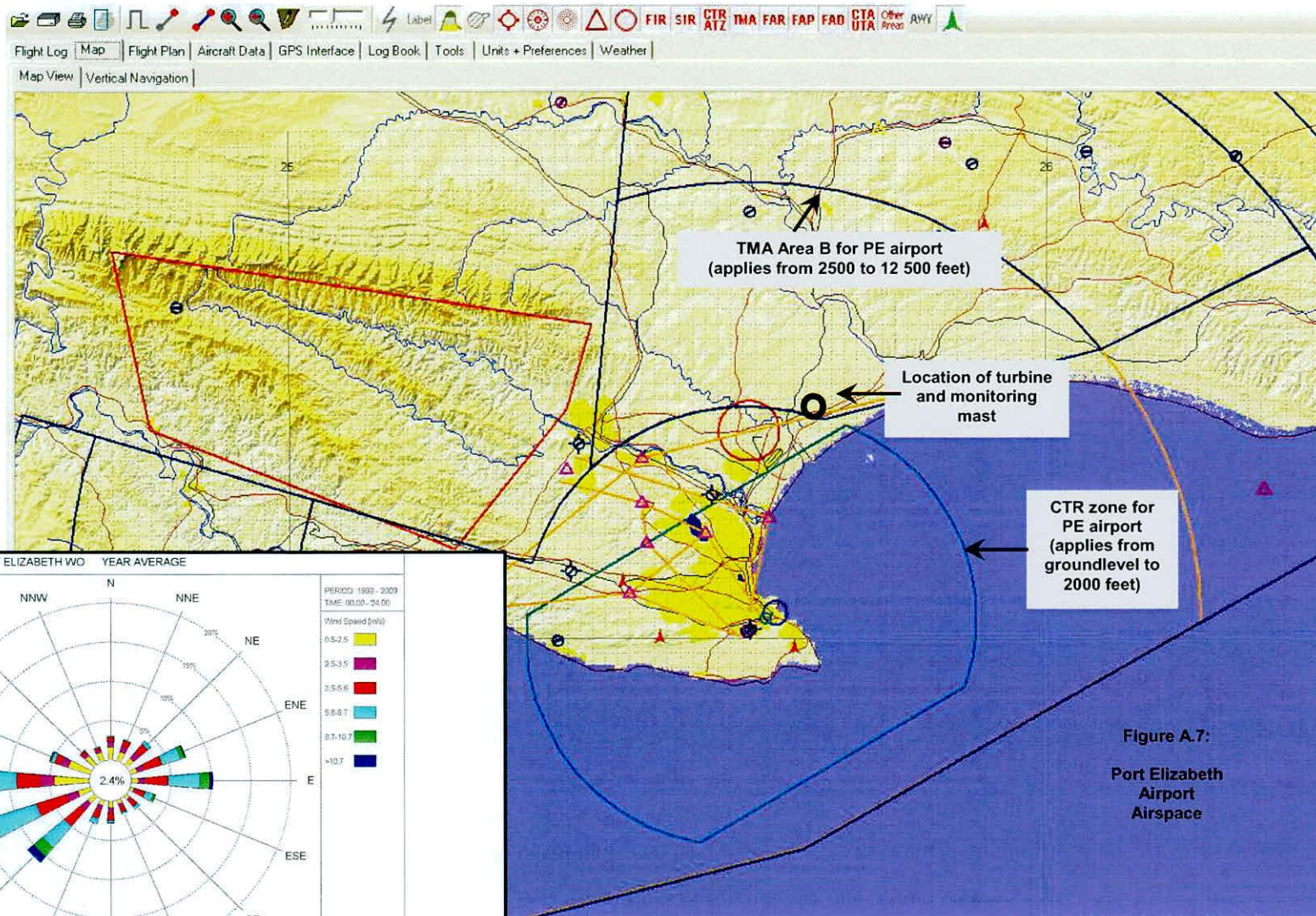


Figure A.7:
Port Elizabeth
Airport
Airspace

APPENDIX B

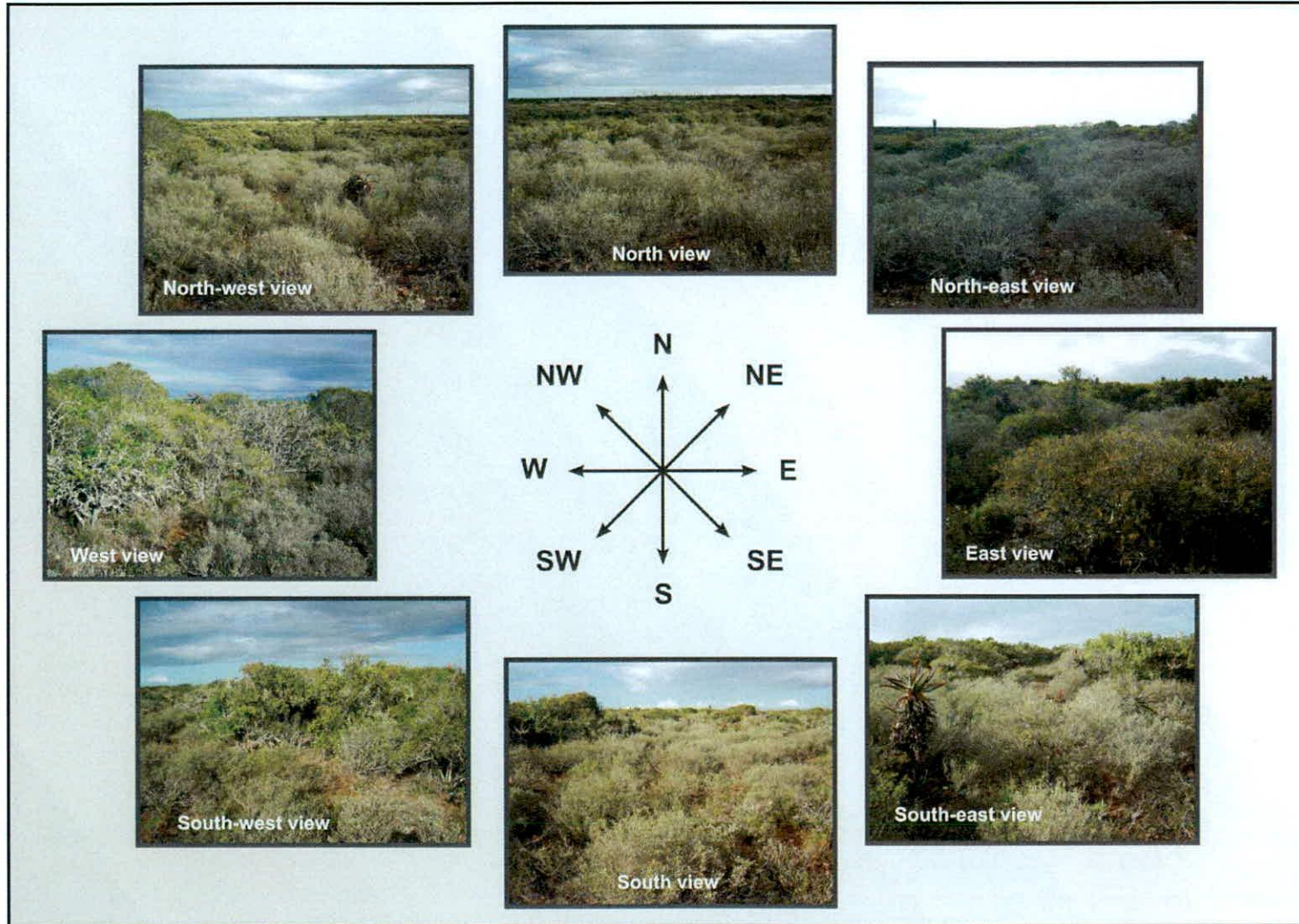
Site Photographs

APPENDIX B.1	Photographs taken in 8 compass directions from the centre of the site for the wind turbine _____	12
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APPENDIX B.3	Photograph of the Dedisa substation located north of the wind turbine site _____	14

APPENDIX B.1

Photographs taken in 8 compass directions from the centre of the site for the wind turbine

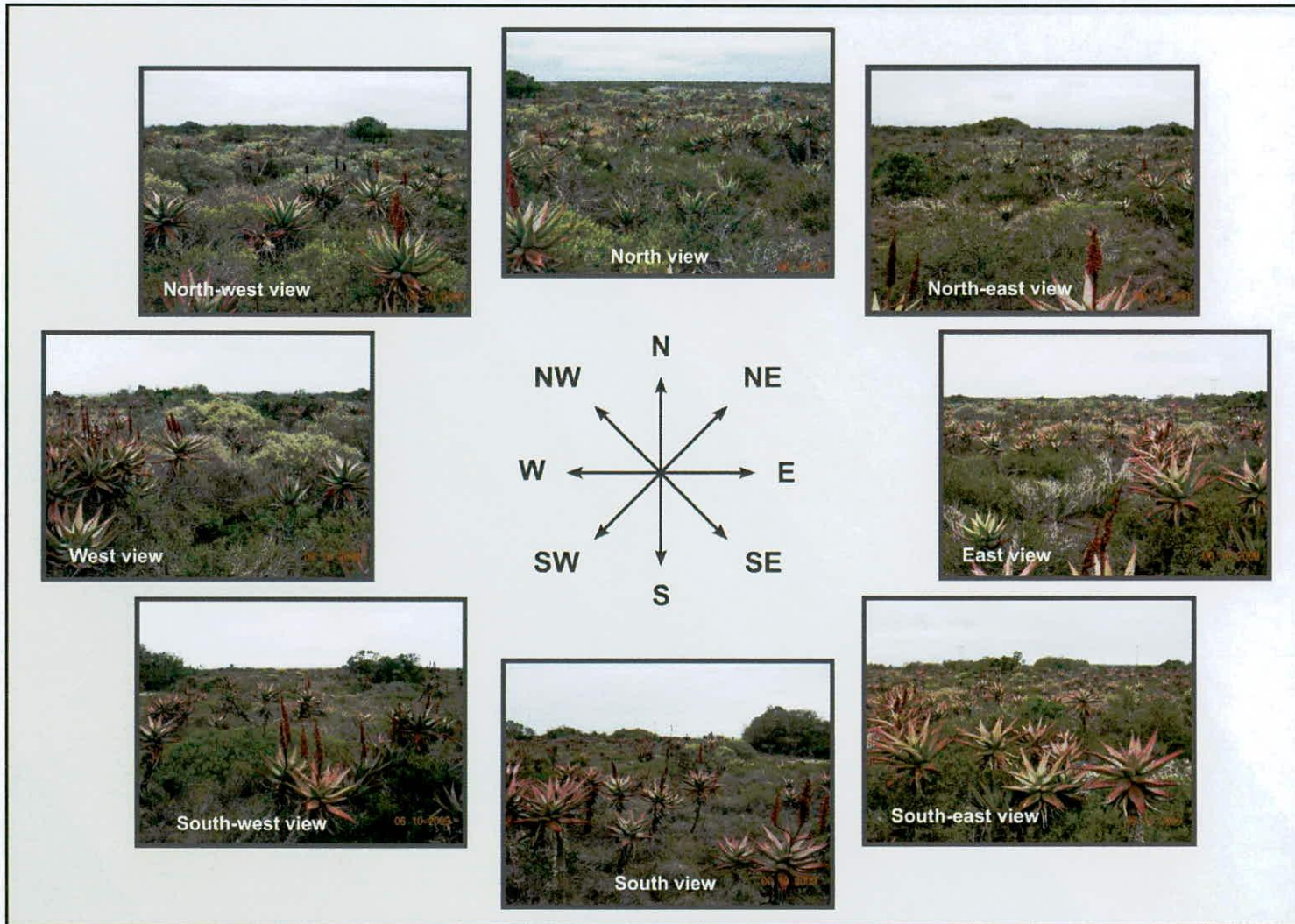
GPS coordinates at centre of site (in WGS 84): S33°45.157' E25°40.597' Elevation: 59 m



APPENDIX B.2

Photographs taken in 8 compass directions from the centre of the site for the wind monitoring mast

GPS coordinates at centre of site (in WGS 84): S33°45.714' E25°41.074' Elevation: 50 m



APPENDIX B.3 Photograph of the Dedisa substation located north of the wind turbine site



APPENDIX C

Facility Illustrations

- Figure C.1: Example of a typical 60m high wind monitoring mast of the type to be used by Electrawinds at Coega _____ 16
- Figure C.2: Photo of a Siemens 2.3 MW turbine, an example of the typical type of turbine to be used by Electrawinds at Coega _____ 17
- Figure C.3: Technical Specifications for Siemens 2.3 MW turbine, an example of the typical type of turbine proposed by Electrawinds at Coega _____ 18



Figure C.1: Example of a typical 60m high wind monitoring mast of the type to be used by Electrawinds at Coega.



Figure C.2: Photo of a Siemens 2.3 MW turbine, an example of the typical type of turbine to be used by Electrawinds at Coega.

SIEMENS

Technical Specifications
 2.3 MW VS
 Document PG-R-03-10-0000-0040-04
 Restricted Release

2.3 MW VS Technical Specifications

Rotor		Generator	
Type	3-bladed, horizontal axis	Type	Asynchronous
Position	Upwind	Nominal power	2300 kW
Diameter	82.4 m	Protection	IP 54
Swept area	5300 m ²	Cooling	Integrated heat exchanger
Synchronous rotor speed	6-18 rpm	Insulation class	F
Power regulation	Pitch regulation	Generator designation	AMA 500L4 BAYH
Rotor tilt	6 degrees	Generator manufacturer	ABB
Blades		Grid terminals (LV)	
Type	Self-supporting	Nominal power	2300 kW
Blade length	40 m	Voltage	690 V
Tip chord	0.8 m	Frequency	50 Hz
Root chord	3.1 m	Yaw system	
Aerodynamic profile	NACA 63.xxx, FFAxxx	Type	Active
Material	GRE	Yaw bearing	Externally geared slewing
Surface gloss	Semi-mat, < 30 / ISO2813	Yaw drive	Eight electric gear motors
Surface colour	Light grey, RAL 7035	Yaw brake	Passive friction brake + eight brake motors
Aerodynamic brake		Controller	
Type	Full span pitching	Type	Microprocessor
Activation	Active, fail-safe	SCADA system	WPS via modem
Load supporting parts		Controller designation	WTC 3.0
Hub	Nodular cast iron	Tower	
Main bearing	Spherical roller bearing	Type	Cylindrical or tapered tubular
Main shaft	Alloy steel	Hub height	60 m, 80 m or site specific
Nacelle bed plate	Steel	Corrosion protection	Painted
Transmission system		Surface gloss	Silk mat, 30-40 / ISO2813
Coupling hub - shaft	Flange	Colour	Light grey, RAL 7035
Coupling shaft - gearbox	Shrink disc	Operational data	
Gearbox type	3-stage planetary/helical	Cut-in wind speed	4 m/s
Gearbox ratio	1 : 91	Nominal power at	13-14 m/s
Gearbox lubrication	Splash / forced lubrication	Cut-out wind speed	25 m/s
Oil volume	Approx. 400 l	Maximum 2 s gust	55 m/s (standard version) 60-80 m/s (special version)
Gearbox cooling	Separate oil cooler	Weights (approximately)	
Gearbox designation	PEAB 4456	Rotor	54,000 kg
Gearbox manufacturer	Flender AG	Nacelle	82,000 kg
Coupling gear - generator	Double flexible coupling	Tower for 60 m hub height	81,000 kg
Mechanical brake		Tower for 80 m hub height (off-shore)	98,000 kg
Type	Fail-safe disc brake	Tower for 80 m hub height	158,000 kg
Position	High speed shaft	Canopy	
Number of callipers	2	Type	Totally enclosed
Canopy		Material	Steel

Siemens Wind Power A/S reserves the right to change the above specifications without notice

Figure C.3: Technical Specifications for Siemens 2.3 MW turbine, an example of the typical type of turbine proposed by Electrawinds at Coega.

APPENDIX D
Specialist Report:
Visual Impact Assessment

DRAFT VISUAL IMPACT REPORT

Henry Holland (02 October 2009)

EXECUTIVE SUMMARY

The CSIR has been appointed by Electrawinds NV as the independent environmental assessment practitioners to undertake a basic assessment (BA) for the proposed wind turbine and anemometer mast. The CSIR has, in turn, appointed Henry Holland of map(this); to conduct a visual impact assessment (VIA) for the proposed development.

The components of the project which are most relevant to this report are:

- A wind monitoring mast; and
- A single 'test' wind turbine with a total height (including rotor) of 120m.

Visual impact criteria:

Criteria	Impact
Viewer Sensitivity	AENP Viewpoints – Highly sensitive; Tourists – Highly sensitive viewers; Motorists – Low sensitivity viewers; Residents – Highly sensitive viewers
Visibility of Development	High
Visual Exposure	Medium to High within the IDZ
Visual Intrusion	Medium due to the surrounding industrial landscape

Visual impact during construction:

The significance of the visual impact during the construction phase is expected to be medium (rather than high) due to the short duration and medium intensity of the impact.

Visual impact during the operational phase:

The significance of the visual impact on scenic views in surrounding protected areas such as the Addo Elephant National Park will be low to medium (and not high) due to the distances involved. Most protected areas are more than 10km away from the site.

Visual impact on tourists using main roads in the region will be high due to the close proximity of the N2 and R102 roads to the site. The impact is likely to be positive.

Visual impact on residents will be low to moderately significant due to their distance from the site.

The significance of visual impact on motorists will be low since they will be exposed to the site for a short period and their focus will not be on the landscape.

Mitigation measures focus on enhancing the positive aspects of the development. Most of the measures provides for an uncluttered site with only the turbine (and wind mast) in view.

Wind turbines and wind farms are symbols of 'clean energy' and are often seen as a positive addition to the landscape. This is obviously not the case for all viewers, but foreign tourists are likely to be accustomed to wind farms in landscapes, especially tourists from the USA and Europe where wind farms are common features of landscapes.

LIST OF ABBREVIATIONS

CDC	Coega Development Corporation
DEM	Digital Elevation Model
EIA	Environmental Impact Assessment
GIS	Geographic Information System
GLVIA	Guideline for Involving Visual and Aesthetic Specialists in EIA Processes
I&APs	Interested and Affected Parties
IDP	Integrated Development Plan
IDZ	Industrial Development Zone
VIA	Visual Impact Assessment

GLOSSARY OF TERMS

Digital Elevation Model (DEM)	A digital or computer representation of the topography of an area.
Nature-based tourism	Tourism that involves travelling to relatively undisturbed natural areas with the specific objective of studying, admiring and enjoying the scenery, fauna and flora, either directly or in conjunction with activities such as trekking, canoeing, mountain biking, hunting and fishing (Turpie <i>et al.</i> 2005)
Photomontage	A digital photomontage is the end result of a computer graphics operation in which portions of two (or more) digital images are combined or composited into a single digital image (Zack 2006).
Principal representative viewpoints	Principal representative viewpoints are identified during the <u>visual baseline</u> desk study and field survey. They should be representative of the <u>visual amenity</u> of the area and include walking public footpaths and visiting areas of open public access. A comprehensive photographic record of these points supports the visual impact assessment (GLVIA, 2002)
Receptor	An element or assemblage of elements that will be directly or indirectly affected by the proposed development.
Sense of place	That distinctive quality that makes a particular place memorable to the visitor, which can be interpreted in terms of the <u>visual character</u> of the landscape. The unique quality or character of a place, whether natural, rural or urban. Relates to uniqueness, distinctiveness or strong identity (Oberholzer 2005).
Viewer sensitivity	The assessment of the receptivity of viewer groups to the visible landscape elements and visual character and their perception of visual quality and value. The sensitivity of viewer groups depends on their activity and awareness within the affected landscape, their preferences, preconceptions and their opinions.
Viewshed	A viewshed is an area of land, water, and other environmental elements that is visible from a fixed vantage point. In digital imaging, a viewshed is a binary raster indicating the visibility of a viewpoint for an area of interest. A pixel with a value of unity indicates that the viewpoint is visible from that pixel, while a value of zero indicates that the viewpoint is not visible from the pixel.

Visibility of Project	The geographic area from which the project will be visible, or view catchment area. (The actual zone of visual influence of the project may be smaller because of screening by existing trees and buildings). This also relates to the number of receptors affected (Oberholzer 2005)
Visual absorption capacity (VAC)	Visual Absorption Capacity signifies the ability of the landscape to accept additional human intervention without serious loss of character and visual quality or value. VAC is founded on the characteristics of the physical environment such as vegetative screening, diversity of colours and patterns and topographic variability. It also relates to the type of project in terms of its vertical and horizontal scale, colours and patterns. A high VAC rating implies a high ability to absorb visual impacts while a low VAC implies a low ability to absorb or conceal visual impacts.
Visual baseline	A description of the extent and nature of existing views of the site from representative viewpoints, and the nature and characteristics of the visual amenity of the potentially sensitive <u>visual receptors</u> (GLVIA, 2002)
Visual envelope	The approximate extent within which the development can be seen. The extent is often limited to a distance from the development within which views of the development are expected to be of concern.
Visual exposure	Visual exposure refers to the relative visibility of a project or feature in the landscape (Oberholzer, 2005). Exposure and visual impact tend to diminish exponentially with distance.
Visual impact	Changes to the visual character of available views resulting from the development that include: obstruction of existing views; removal of screening elements thereby exposing viewers to unsightly views; the introduction of new elements into the viewshed experienced by visual receptors and intrusion of foreign elements into the viewshed of landscape features thereby detracting from the visual amenity of the area.
Visual impact assessment	A specialist study to determine the visual effects of a proposed development on the surrounding environment. The primary goal of this specialist study is to identify potential risk sources resulting from the project that may impact on the visual environment of the study area, and to assess their significance. These impacts include landscape impacts and visual impacts.
Visual intrusion	Visual intrusion indicates the level of compatibility or congruence of the project with the particular qualities of the area – its 'sense of place'. This is related to the idea of context and maintaining the integrity of the landscape (Oberholzer 2005).
Visual receptors	Visual receptors include viewer groups such as the local community, residents, workers, the broader public and visitors to the area, as well as public or community areas from which the development is visible.
Visual resource	Visual resource is an encompassing term relating to the visible landscape and its recognisable elements which, through their coexistence, result in a particular landscape and visual character

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1 INTRODUCTION

The CSIR has been appointed by Electrawinds NV as the independent environmental assessment practitioners to undertake a basic assessment (BA) of the proposed wind turbine and anemometer mast. CSIR has, in turn, appointed Henry Holland of map (this); to conduct a visual impact assessment (VIA) of the proposed development.

This VIA is based on guidelines for visual assessment specialist studies as set out by South Africa's Western Cape Department of Environmental Affairs and Development Planning (DEA&DP) (Oberholzer 2005) as well as guidelines provided by the Landscape Institute of the UK (GLVIA 2002). The DEA&DP guideline recommends that a visual impact assessment consider the following specific concepts (from Oberholzer 2005):

- An awareness that 'visual' implies the full range of visual, aesthetic, cultural and spiritual aspects of the environment that contribute to the area's sense of place.
- The considerations of both the natural and cultural landscape, and their interrelatedness.
- The identification of all scenic resources, protected areas and sites of special interest, together with their relative importance in the region.
- An understanding of the landscape processes, including geological, vegetation and settlement patterns, which give the landscape its particular character or scenic attributes.
- The need to include both quantitative criteria, such as 'visibility', and qualitative criteria, such as aesthetic value or sense of place.
- The need to include visual input as an integral part of the project planning and design process, so that the findings and recommended mitigation measures can inform the final design, and hopefully the quality of the project.
- The need to determine the value of visual/aesthetic resources through public involvement.

1.1 SCOPE OF STUDY

1.1.1 *Terms of Reference*

The visual input to provide a rapid visual assessment (at the level of detail appropriate for a Basic Assessment) that presents and evaluates the visual impact of the turbines from the various viewsheds in the vicinity, including the N2 national road running along the front of the Coega IDZ under different operating conditions that highlight the potential impacts on sensitive visual receptors. Computer-based simulations must be generated of the wind monitoring mast and test turbine in the landscape, for the most important view points.

In order to provide this input, the following broad ToRs have been specified for the specialist:

- Identify viewpoints;
- Photograph existing views from selected viewpoints (attend a site visit);
- Super-impose the proposed single demo turbine (referred to as the 'test turbine' above) onto landscape, properly scaled, with views shown from 2 to 4 viewpoints.
- Consider the impacts for both day and night and for different weather conditions as appropriate;
- Assess the visual impacts accordingly and provide mitigation where necessary;
- Provide results as a written visual input to the BA report.

1.1.2 Visual Triggers

(Oberholzer 2005) identifies visual triggers which are used to determine the approach and scope of an impact study. The following triggers, related to the receiving environment, are potentially applicable to this project:

- Areas with protection status, such as national parks or nature reserves (e.g. Addo Elephant National Park (AENP));
- Areas with important vistas or scenic corridors (AENP);
- Areas with visually prominent ridge lines or skylines (the height of the turbine will project above the skyline in most views);
- Areas of important tourism or recreational value (Port Elizabeth and AENP).

Triggers related to the nature of the project:

- A significant change to the fabric and character of the area (due to the height and potential visibility of the turbine);
- Possible visual intrusion in the landscape.

1.1.3 Information Base

- Documentation supplied by Electrawinds;
- ToR for the visual specialist;
- Digital spatial topocadastral data at 1:50 000 scale from the Surveyor General: Surveys and Mapping;
- Wind turbine model by Pete Young hosted in the Google 3D Warehouse (<http://sketchup.google.com/3dwarehouse/details?mid=c036208d537d6f98967f3aa7f40c33&prevstart=0>).
- Google Earth software and data.
- Photo of a Siemens SWT-2.3-101 Turbine at <http://newenergyandfuel.com/wp-content/uploads/2009/03/siemans-low-wind-speed-turbine.jpg> (Figure 1.1)
- IUCN database of protected areas (<http://www.wdpa.org/Download.aspx>)



Figure 1.1 An image of a Siemens 2.3MW wind turbine used in the photomontage process.

1.1.4 Assumptions and Limitations

Spatial data used for visibility analysis originate from various sources and scales. Inaccuracy and errors are therefore inevitable. Every effort was made to minimize their effect and where relevant these will be highlighted in the report.

Calculation of the viewsheds does not take into account the potential screening effect of vegetation and buildings. Due to the size and height of the wind turbine, and the relative low thicket cover in the region, the screening potential of vegetation is likely to be minimal over most distances.

The photomontage technique depends on the ability of Google Earth and Google Sketchup Pro to render virtual models of structures accurately in their correct scale/distance relationship. The author has been unable to find documentation concerning rendering accuracy for Google Earth. Comparisons with photos of wind farms in Europe suggest a reasonable accuracy (using similar distance/size ratios).

1.2 METHODOLOGY

1.2.1 Site Visit and Photographic Survey

The site visit (4 August 2009) provided an opportunity to take photos from a number of viewpoints for use in the photomontage process.

1.2.2 Visibility Analysis

A Geographic Information System (GIS) was used to create a digital elevation model (DEM) from which a viewshed for the wind turbine could be calculated.

1.2.3 Photomontage

A technique similar to that described in Zack (2006) was employed to produce the photomontage images for the report. A number of sites were selected from which photos were taken such that the proposed wind turbine would be prominent in the view. Using metadata recorded by the camera and GPS readings scenes portrayed in the photos were reconstructed in Google Earth as accurately as possible. A digital 3D model of the wind turbine¹ was placed in the correct position in the virtual landscape and could then be used as a guide to the size and position of the wind turbine in the photos. A photomontage was then created by super-imposing an image of a wind turbine (see Figure 1.1) at the correct scale and position in the photos.

¹ According to the author: 'Roughly based on Suzlon models. 80m ground to nose cone, 42m blade length.' The dimensions are similar to that of the Siemens model that is proposed for the site.

2 PROJECT DESCRIPTION

2.1 STUDY AREA

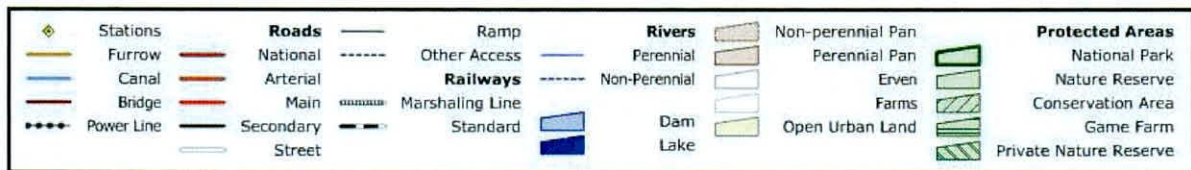


Figure 2.1 Legend for topocadastral data on maps.

Refer to Figure 2.1 for a key to topocadastral data on in-line maps in this document.

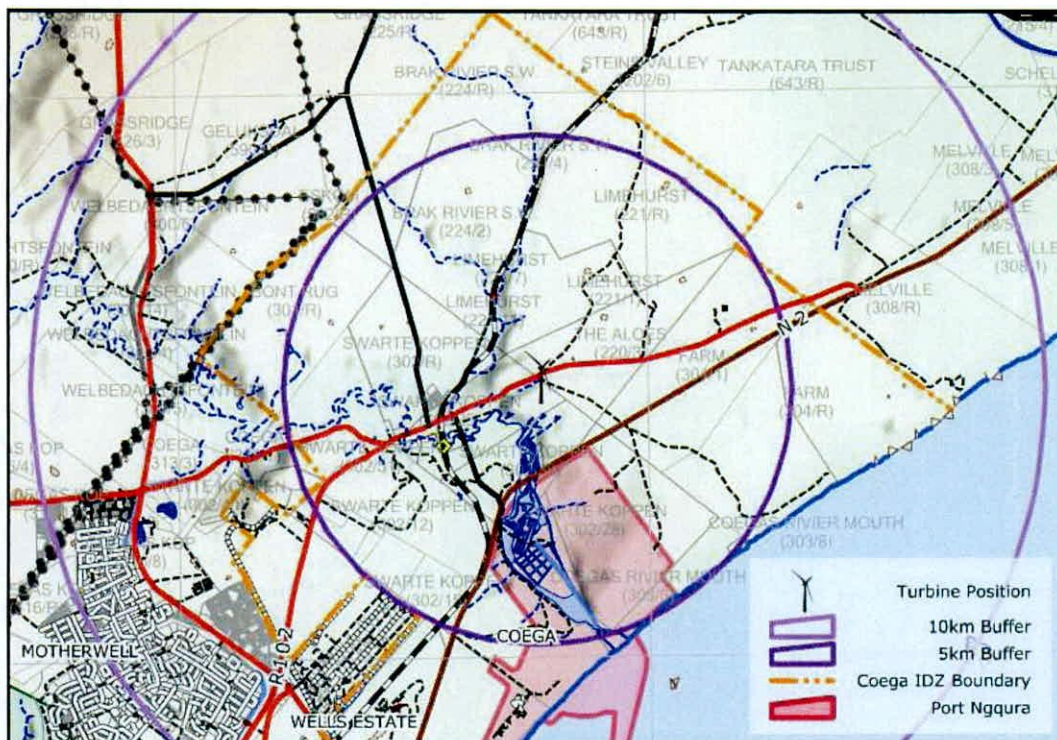


Figure 2.2 Wind turbine position (centre of map).
 Purple circles indicate 5km and 10km distances from the turbine.

The wind (anemometer) mast and test turbine will be located on a ridge inside the Coega Industrial Development Zone (IDZ) (Figure 2.2).

2.2 PROJECT COMPONENTS AND ACTIVITIES

The components of the project which are most relevant to this report are:

- A wind monitoring mast; and
- A single 'test' wind turbine with a total height (including rotor) of 120m.

The wind turbine will have a much larger effect on the landscape and on viewers than the monitoring mast due to its size, the solid tower (as opposed to the lattice structure of the monitoring mast) and the movement of the rotating blades which will attract attention to the turbine. The turbine and wind monitoring mast will be located close to each other and the turbine has therefore been used in all modelling and analyses in order to simplify the process.

3 ASSESSMENT AND MITIGATION OF IMPACTS

The assessment and mitigation of impacts is conducted in the following steps:

- Identification of visual impact criteria (key theoretical concepts).
- Conducting a visibility analysis.
- Assessment of impacts of the project on the landscape and on receptors (viewers) taking into consideration factors such as sensitive viewers and viewpoints, visual exposure and visual intrusion.
- Identification of management action (mitigation measures).

3.1 VISUAL IMPACT CONCEPTS AND ASSESSMENT CRITERIA

3.1.1 *Visual assessment criteria used in assessing magnitude and significance*

The potential visual impact of the proposed turbine (and wind monitoring mast) is assessed using a number of criteria which provide the means to measure the magnitude and determine the significance of the potential impact (Oberholzer 2005). The **visibility** (Section 0) of the project is an indication of where in the region the development will potentially be visible from. The rating is based on viewshed size only and is an indication of how much of a region will potentially be affected visually by the development. A high visibility rating does not necessarily signify a high visual impact, although it can if the region is densely populated with sensitive visual receptors. **Viewer (or visual receptor) sensitivity** (Section 3.1.4) is a measure of how sensitive potential viewers of the development are to changes in their views. Visual receptors are identified by looking at the development viewshed, and include scenic viewpoints, residents, motorists and recreational users of facilities within the viewshed. A large number of highly sensitive visual receptors can be a predictor of a high **intensity/magnitude** visual impact although their distance from the development (measured as **visual exposure** – Section 3.1.5)) and the current composition of their views (measured as **visual intrusion** – Section 3.1.6) will have an influence on the significance of the impact.

Refer to the legend in Figure 2.1 for topocadastral features indicated on in-line maps in this section.