

# Marulan Gas Turbine Facilities

## | | | | | | | Environmental Assessment



**JOINT CONCEPT APPLICATION**

VOLUME 1

MAIN REPORT

August 2008

**Cover illustration: Note this is a graphical representation of a gas turbine facility it may not represent the actual plant.**

**Photograph: C. Bergesen.**

# Statement of Validity

## Submission of Environmental Assessment

Prepared under Part 3A of the *Environmental Planning and Assessment Act 1979*

### Environmental Assessment prepared by

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In respect of

### Applicant & Land Details

Applicant (jointly)	<i>Delta Electricity</i>	<i>EnergyAustralia</i>
	Darling Park, 201 Sussex Street Sydney NSW 2000	570 George Street Sydney NSW 2000

Application No. MP07\_0174

Subject Site Marulan, NSW

Land to be developed Lot & DP

Development Site Lot 2 DP1120270

**Gas Pipeline Corridor**

Lot 2341 DP 62834, Lot 20 DP 113590, Lot 12 DP 727493, Lot 2 DP 732144, Lot 2 DP 750053, Lot 41 DP 750053, Lot 76 DP 750053, Lot 77 DP 750053, Lot 78 DP 750053, Lot 89 DP 750053, Lot 92 DP 750053, Lot 95 DP 750053, Lot 99 DP 750053, Lot 100 DP 750053, Lot 104 DP 750053, Lot 105 DP 750053, Lot 106 DP 750053, Lot 107 DP 750053, Lot 108 DP 750053, Lot 140 DP 750053, Lot 141 DP 750053, Lot 144 DP 750053, Lot 152 DP 750053, Lot 153 DP 750053, Lot 154 DP 750053, Lot 155 DP 750053, Lot 157 DP 750053, Lot 158 DP 750053, Lot 158 DP 750053, Lot 160 DP 750053, Lot 161 DP 750053, Lot 162 DP 750053, Lot 167 DP 750053, Lot 172 DP 750053, Lot 176 DP 750053, Lot 177 DP 750053, Lot 186 DP 750053, Lot 187 DP 750053, Lot 188 DP 750053, Lot 189 DP 750053, Lot 191 DP 750053, Lot 197 DP 750053, Lot 236 DP 750053, Lot 237 DP 750053, Lot 238 DP 750053, Lot 240 DP 750053, Lot 249 DP 750053, Lot 258 DP 750053, Lot 287 DP 750053, Lot 52 DP 751298, Lot 53 DP 751298, Lot 55 DP 751298, Lot 56 DP 751298, Lot 57 DP 751298, Lot 124 DP 751298, Lot 125 DP 751298, Lot 137 DP 751298, Lot 140 DP 751298, Lot 155 DP 751298, Lot 156 DP 751298, Lot 157 DP 751298, Lot 173 DP 751298, Lot 455 DP 771909, Lot 101 DP 778396, Lot 4 DP 872712, Lot 4 DP 872712, Lot 4 DP 872712, Lot 8 DP 874693, Lot 18 DP 1056592, Crown Road Reserve, portion Canyonleigh Road (Upper Lachlan Shire Council)

**Note gas pipeline alignment to be refined during Project Approval**

**Project Summary** Construction and operation of two gas -fired power stations and associated infrastructure.

### Environmental Assessment

An Environmental Assessment is attached.

### Declaration

I certify that I have prepared the contents of the Environmental Assessment in accordance with the requirements of the *Environmental Planning and Assessment Act 1979* and Regulation and that, to the best of my knowledge, the information contained in this report is not false or misleading.

Signature



Name Nicole Brewer  
Date 29 August 2008

Name Ian McCardle  
Date 29 August 2008

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## Notes on Text

As a determination of the project will only be made after the Environmental Assessment has been on public display and submissions considered, the future conditional tense is used throughout this Environmental Assessment when describing the project, alternatives and assessing impacts. “Would” is, therefore, used throughout the text in preference to “will”.

If all approvals are given for the project to proceed, all “would” references should be interpreted as “will”, subject to final conditions of consent.



## Abbreviations

### ABBREVIATIONS

<b>AADT</b>	Annual Average Daily Traffic
<b>ABS</b>	Australian Bureau of Statistics
<b>AGO</b>	Australian Greenhouse Office
<b>AHC</b>	Australian Heritage Commission
<b>AHD</b>	Australian Height Datum
<b>AHIMS</b>	Aboriginal Heritage Information Management System
<b>ANEPM</b>	National Environment Protection Measure for Ambient Air Quality
<b>ANZECC</b>	Australia and New Zealand Environment and Conservation Council
<b>ARI</b>	Annual Recurrence Interval
<b>AWS</b>	Automatic Weather Station
<b>BCA</b>	Building Code of Australia
<b>BoM</b>	Bureau of Meteorology
<b>Calmet</b>	A 3-D meteorological model designed to provide data for use in Calpuff
<b>Calpuff</b>	An airquality dispersion model
<b>CASA</b>	Civil Aviation and Safety Authority
<b>CCGT</b>	Combined Cycle Gas Turbine
<b>CEMP</b>	Construction Environmental Management Plan
<b>CHMP</b>	Cultural Heritage Management Plan
<b>CFC</b>	Chloro-Fluorocarbons
<b>CO<sub>2</sub></b>	Carbon dioxide
<b>CO<sub>2</sub>-e</b>	Carbon dioxide equivalent
<b>DA</b>	Development Application
<b>DCP</b>	Development Control Plan
<b>DECC</b>	Department of Environment and Climate Change
<b>DEHA</b>	Department of Environment, Heritage and the Arts
<b>DOP</b>	Department of Planning
<b>EA</b>	Environmental Assessment
<b>ECRTN</b>	Environmental Criteria for Road Traffic Noise
<b>EMF</b>	Electric and Magnetic Field
<b>EMP</b>	Environmental Management Plan
<b>EMS</b>	Environmental Management Systems
<b>ENCM</b>	Environmental Noise Control Manual
<b>EP&amp;A Act</b>	NSW Environmental Planning and Assessment Act 1979
<b>EP&amp;A Reg</b>	NSW Environmental Planning and Assessment Regulation 2000
<b>EPA</b>	Environment Protection Authority
<b>EPBC Act</b>	Commonwealth <i>Environment Protection and Biodiversity Conservation Act</i> 1999
<b>EPI</b>	Environmental Planning Instrument
<b>ESD</b>	Ecologically Sustainable Development
<b>GPS</b>	Global Positioning System
<b>GT</b>	Gas Turbine
<b>HAZID</b>	Hazard Identification
<b>HIPAP</b>	Department of Planning's Hazardous Industry Planning Advisory Paper
<b>HHV</b>	Higher Heating Value
<b>HRSG</b>	Heat Recovery Steam Generator
<b>INP</b>	Industrial Noise Policy (EPA, 2000)
<b>IPCC</b>	International Panel on Climate Change
<b>IPRA</b>	International Power (Australia) Pty Ltd)
<b>ISO</b>	International Standards Organisation
<b>JSA</b>	Job Safety Analysis
<b>LALC</b>	Local Aboriginal Land Council
<b>LEP</b>	Local Environmental Plan
<b>LGA</b>	Local Government Area

## Abbreviations

<b>LHV</b>	Lower Heating Value
<b>LoS</b>	Level of Service
<b>MGA</b>	Map Grid of Australia
<b>MSDS</b>	Material Safety Data Sheet
<b>MSL</b>	Mean Sea Level
<b>MLEP</b>	Mulwaree Local Environment Plan 1995
<b>NA</b>	Not Applicable
<b>NEM</b>	National Electricity Market
<b>NEMMCO</b>	National Electricity Market Management Company
<b>NEPC</b>	National Environment Protection Council
<b>NEPM</b>	National Environment Protection Measure
<b>NGRS</b>	National Greenhouse Response Strategy
<b>NHMRC</b>	National Health and Medical Research Council
<b>NO<sub>2</sub></b>	Nitrogen Dioxide
<b>NO<sub>x</sub></b>	Oxides of Nitrogen
<b>NP&amp;W Act</b>	NSW <i>National Parks and Wildlife Act 1974</i>
<b>NPWS</b>	National Parks and Wildlife Service
<b>NSW</b>	New South Wales
<b>O<sub>3</sub></b>	Ozone
<b>OCGT</b>	Open Cycle Gas Turbine
<b>OEMP</b>	Operation Environmental Management Plan
<b>PAD</b>	potential archaeological deposit
<b>PAH</b>	Polycyclic Aromatic Hydrocarbons
<b>PASS</b>	Potential Acid Sulphate Soils
<b>PB</b>	Parsons Brickerhoff
<b>PFM</b>	Planning Focus Meeting
<b>PHA</b>	Preliminary Hazard Analysis
<b>PHLALC</b>	Peak Hill Local Aboriginal Land Council
<b>PM<sub>10</sub></b>	Particles effectively less than 10µm diameter
<b>PM<sub>2.5</sub></b>	Particles effectively less than 2.5µm diameter
<b>POEO Act</b>	NSW <i>Protection of the Environment Operations Act 1997</i>
<b>REP</b>	Regional Environmental Plan
<b>RFI Act</b>	NSW <i>Rivers and Foreshores Improvements Act 1948</i>
<b>RNE</b>	Register of the National Estate
<b>ROTAP</b>	Rare or Threatened Australian Plants
<b>RPM</b>	Revolutions per Minute
<b>RTA</b>	NSW Roads and Traffic Authority
<b>SCR</b>	Selective Catalytic Reduction
<b>SEDA</b>	Sustainable Energy Development Authority
<b>SEPP</b>	State Environmental Planning Policy
<b>SIS</b>	Species Impact Statement
<b>SO<sub>2</sub></b>	Sulphur dioxide
<b>SO<sub>x</sub></b>	Sulphur Oxides
<b>SOO</b>	Statement of Opportunities
<b>TAPM</b>	The Air Pollution Model
<b>TCP</b>	Tree Clearance Protocol
<b>TOC</b>	Total Organic Carbon
<b>TPH</b>	Total Petroleum Hydrocarbons
<b>TSC Act</b>	NSW <i>Threatened Species Conservation Act 1995</i>
<b>TSP</b>	Total suspended particulate
<b>TSP Act</b>	NSW Threatened Species Act 1995
<b>TSS</b>	total suspended sediment
<b>VOC</b>	Volatile Organic Compound
<b>WM Act</b>	Water Management Act 2000

## Abbreviations

### UNITS

$\mu\text{m}$	Microns
<b>cm</b>	centimetres
<b>g</b>	Grams
<b>GL</b>	Gigalitre ( $10^9$ L or $10^6$ m <sup>3</sup> )
<b>GWh</b>	Gigawatt Hour
<b>Ha</b>	hectare
<b>hr</b>	Hour
<b>Hz</b>	Hertz
<b>kg</b>	Kilograms
<b>kJ</b>	Kilojoules
<b>kL</b>	Kilolitre ( $10^3$ L or 1 m <sup>3</sup> )
<b>km</b>	Kilometre
<b>km/hr</b>	Kilometres per hour
<b>kPa</b>	Kilopascals
<b>kV</b>	Kilovolts
<b>kW</b>	Kilowatts
<b>m</b>	Metres
<b>mg</b>	Milligrams
<b>m<sup>2</sup></b>	square metres
<b>m<sup>3</sup></b>	cubic metres
<b>MHz</b>	Megahertz
<b>ML</b>	Megalitre ( $10^6$ L or $10^3$ m <sup>3</sup> )
<b>MW</b>	Megawatts
<b>pa</b>	per annum
<b>ppm</b>	Parts per million
<b>pmpy</b>	per million per year
<b>s</b>	second
<b>SG</b>	Density
<b>t</b>	Tonne
<b>Yr</b>	Year



## Abbreviations

## Glossary

### Aboriginal archaeological site (Aboriginal site)

A place where physical remains or modification of the natural environment indicate past and 'traditional' activities by Aboriginal people. Site types include artefact scatters, isolated artefacts, burials, shell middens, scarred trees, quarries and contact sites.

### acid sulphate soils (ASS)

Soils containing pyrite which produces sulphuric acid when exposed to oxygen.

### ambient

Surrounding environment.

### aquifer

Rock formation containing water in recoverable quantities.

### background scatter

Aboriginal artefacts that cannot be usefully related to a place or focus of past activity.

### biodiversity

First coined in 1988 as a contraction of biological diversity; diversity traditionally referring to species richness and species abundance. Biodiversity has been defined subsequently as encompassing biological variety at genetic, species and ecosystem scales (DASETT 1992). The maintenance of biodiversity, at all levels, is acknowledged internationally as a high conservation priority, and is protected by the International Convention on Biological Diversity 1992.

### bunds

An earthwork or wall to contain and control spillages, normally associated with tank farms, fuelling and chemical storage facilities.

### CO<sub>2</sub>-e

The carbon dioxide equivalent relates to the greenhouse warming potential (GWP) of a certain gas compared to that of carbon dioxide where carbon dioxide has a GWP of 1. For example, methane (CH<sub>4</sub>) has a GWP of 21, meaning that a release of 100 tonnes of CH<sub>4</sub> would be the equivalent to releasing 2100 tonnes of CO<sub>2</sub> in terms of global warming.

### Construction Environmental Management Plan

An element of an Environmental Management Plan that addresses the control, training and monitoring measures to be implemented during the construction phase of a project in order to avoid, minimise or ameliorate potentially adverse impacts identified during environmental assessments.

### conservation

The management of natural resources in a way that will benefit both present and future generations.

### cumulative effect

Refers to the accumulation of effects over time.

### dB(A)

The A-weighting has a frequency response corresponding approximately to that of human hearing. People's hearing is most sensitive to sounds at mid frequencies (500 Hz to 4000 Hz), and less sensitive at lower and higher frequencies. Thus, the level of a sound in dBA is a good measure of the "loudness" of that sound. Different sources having the same dBA level generally sound about equally as loud, although the perceived loudness can also be affected by the character of the sound (eg the loudness of human speech and a distant motorbike may be perceived differently, although they are of the same dBA level).

## Glossary

<b>dB(C)</b>	The C-Weighting has a relatively flat response. C- weighting is used in evaluating annoying community noises such as low frequency sound.
<b>Ecologically Sustainable Development</b>	Using, conserving and enhancing the community's resources so that ecological processes, on which life depends, are maintained and the total quality of life, now and in the future can be increased. <b>ecosystem</b> An interdependent system of interacting plants, animals and other organisms together with the non-living (physical and chemical) components of their surroundings.
<b>effluent</b>	The outflow of liquid e.g. from sewage or an industrial process.
<b>emergency response</b>	The reaction by emergency services such as Fire, Police, Ambulance, Industrial Fire Brigades, etc., to an emergency.
<b>endangered species</b>	Those plants and animal species likely to become extinct unless action is taken to remove or control the factors that threaten their survival.
<b>environment</b>	The physical, biological, cultural, economic and social characteristics of an area, region or site.
<b>Environmental Assessment</b>	The orderly and systematic evaluation of a proposal, including alternatives and objectives, and its effects on the environment, including the mitigation and management of these effects.
<b>environmental management</b>	That part of the overall management system which includes organisational structure, planning activities, responsibilities, procedures, processes and resources for developing, implementing, achieving, reviewing and maintaining environmental policy. (Refer to related term Environmental Management System).
<b>Environmental Management Plan</b>	The control, training and monitoring measures to be implemented during the design, construction and operation phases of a project in order to avoid, minimise or ameliorate potentially adverse impacts identified during environmental (being socio-economic, cultural, physical, biological) assessments.
<b>Environmental Management System</b>	The concept and major components of an Environmental Management System (EMS) are set out in the Australian/New Zealand Standard (AS/NZS) ISO 14001. An EMS has several key components as set out below: organisational commitment, corporate environmental policy, environmental aspects register, objectives and performance indicators, environmental management program documentation (often called an Environmental Management Plan or EMP), operational and emergency procedures, responsibility and reporting structure, training and awareness program, environmental impact, regulatory and legal compliance, and environmental performance review audits performance monitoring and measurement.
<b>fauna</b>	Animals.

## Glossary

<b>fire fence</b>	A gap in vegetation or fuels which prevents or hinders the spread of fire.
<b>flora</b>	Plants.
<b>floristic composition</b>	The plant species present in a particular community, sub-community or site.
<b>free ammonia</b>	The toxic fraction of ammonia (NH <sub>3</sub> ) that is undissociated and therefore available for uptake by organisms. The usual source of ammonia to waterways is domestic sewage and industrial effluents.
<b>GGAS</b>	The Greenhouse Gas Reduction Scheme (GGAS) commenced on 1 January 2003. It is one of the first mandatory GHG emissions trading schemes in the world and is specifically associated with the electricity generation sector. GGAS aims to reduce GHG emissions in NSW by 5% per capita below 1989/90 levels by 2007, by encouraging project based activities to offset the production of GHG emissions.
<b>geotechnical</b>	Relating to the form, arrangement and structure of the geology.
<b>Greenhouse Challenge Plus</b>	The programme integrates the Generator Efficiency Standards and the Greenhouse Friendly TM initiative into a single industry programme, focused on reducing greenhouse gas, promoting energy efficiency, integrating greenhouse issues into decision making and allowing for a consistent manner for reporting greenhouse gas emissions.
<b>Greenhouse Gas</b>	A gas which has an effect on the radioactive absorptivity of the earth's atmosphere and the atmosphere's temperature.
<b>Greenhouse Effect</b>	Predicted global climatic change (e.g. global warming) associated with build up of certain gases (such as water vapour, carbon dioxide, methane, chlorofluorocarbons, ozone, nitrous oxide, etc.) within the atmospheric environment of the earth. These are known as Greenhouse Gases.
<b>Greenhouse gas intensity</b>	the amount of greenhouse gases per unit of energy produced from a power station (eg in units of kg CO <sub>2</sub> -e/MWh).
<b>Greenhouse Gas Protocol</b>	A globally accepted procedure for companies to quantify, report and reduce their greenhouse gas emissions.
<b>groundwater</b>	Subsurface water contained within the saturated zone.
<b>heritage (cultural heritage)</b>	A term which encompasses Aboriginal and post-contact archaeological sites and material remains (cultural resources).
<b>higher heating value</b>	The heat content of fuel, measured in a bomb calorimeter when the products of combustion are cooled to the initial temperature and all of the water vapour formed during combustion is condensed to liquid. This gives the gross, or higher heat content of the fuel, which includes in the reported value the heat of vaporisation of the water produced from combustion of hydrogen atoms in the fuel. The lower heating value excludes the heat of vaporisation of the water produced from combustion of hydrogen atoms in the fuel.

## Glossary

<b>Hydrocarbons</b>	A class or compounds containing only carbon and hydrogen in various structures. Both naturally occurring and from anthropogenic sources.
<b>Hydrology</b>	Surface water and groundwater and their interaction with earth materials.
<b>Hydrogeology</b>	The study of subsurface water in its geological context.
<b>INTANAL</b>	Specialist traffic model for intersection analysis.
<b>Invertebrate</b>	An animal without a backbone.
<b>Isolated find</b>	Single stone artefact, not located within a rock shelter which occurs without any associated evidence of Aboriginal occupation within a radius of 60 m.
<b>LA<sub>1</sub></b>	The noise level exceeded for 1% of the 15 minute interval.
<b>LA<sub>10</sub></b>	The noise level exceeded for 10% of the 15 minute interval. This is commonly referred to as the average maximum noise level.
<b>LA<sub>90</sub></b>	The LA <sub>90</sub> level is the noise level which is exceeded for 90% of the sample period. During the sample period, the noise level is below the LA <sub>90</sub> level for 10% of the time. This measure is commonly referred to as the background noise level.
<b>LA<sub>eq</sub></b>	The equivalent continuous sound level (LA <sub>eq</sub> ) is the energy average of the varying noise over the sample period and is equivalent to the level of a constant noise which contains the same energy as the varying noise environment. This measure is also a common measure of environmental noise and road traffic noise.
<b>LA<sub>eq</sub> (1hr)</b>	The LA <sub>eq</sub> noise level for a one hour period.
<b>LA<sub>eq</sub> (15 hr)</b>	The LA <sub>eq</sub> noise level for the period 7am to 10pm.
<b>LA<sub>eq</sub> (9 hr)</b>	The LA <sub>eq</sub> noise level for the period 10pm to 7am.
<b>L<sub>eq</sub></b>	The equivalent continuous sound level in dB(A); that is, the constant sound level which has the same acoustic energy as the original fluctuating noise for the same period of time.
<b>Level of Service</b>	A description of the operating performance of a road or intersection as defined in Austroads 'Guide to Traffic Engineering Practice, Pt 2 – Road Capacity.'
<b>Lithologies</b>	Rock types.
<b>Lower Heating Value (LHV)</b>	The heat content of fuel, measured in a bomb calorimeter when the products of combustion are cooled to the initial temperature and all of the water vapour formed during combustion is condensed to liquid. The lower heating value excludes the heat of vaporisation of the water produced from combustion of hydrogen atoms in the fuel.
<b>mean</b>	The sum of n values divided by n.
<b>median</b>	The middle value of a set of values.
<b>middens</b>	Evidence of Aboriginal occupation of an area.

## Glossary

<b>Monitoring</b>	The checking of impacts of a proposal or an existing activity in order to improve or evaluate environmental management practices. To check the efficiency and effectiveness of the environmental impact assessment process. To determine if the requirements of environmental legislation and associated regulations are being met.
<b>native vegetation</b>	A broad term for vegetation comprised of plant species which occur naturally in Australia (but which are not necessarily indigenous).
<b>natural gas</b>	Combustible gas formed naturally in the earth.
<b>Organochlorines</b>	A group of organic chemicals used in pesticides. Most organochlorine pesticides have low water-solubility, but high chemical and biological stability. They are fat soluble and tend to accumulate in the fat tissue of organisms.
<b>Operation Environmental Management Plan</b>	An element of an Environmental Management Plan that addresses the control, training and monitoring measures to be implemented during the construction phase of a project in order to avoid, minimise or ameliorate potentially adverse impacts identified during environmental assessments.
<b>Ozone</b>	A form of oxygen having three atoms to the molecule. Ozone is a powerful oxidising agent.
<b>Particulate</b>	Small particles, usually in suspension.
<b>Petroleum hydrocarbons [total petroleum hydrocarbons (TPH)]</b>	A class of organic compounds arising from unburnt fuel sources.
<b>Piles</b>	Type of foundation using columns of concrete, steel or timber.
<b>Plume</b>	Area of impact extending from a source.
<b>Polycyclic aromatic hydrocarbons (PAH)</b>	A class of organic chemicals, PAHs are formed by incomplete combustion of organic material, diagenesis (during or throughout generation) and biosynthesis. PAHs are naturally occurring, however, a significant proportion are the result of anthropogenic combustion.
<b>potable water</b>	Water suitable for drinking.
<b>potential acid sulphate soil (PASS)</b>	Soil material which is waterlogged and contains oxidisable sulphur compounds, usually iron sulphide (pyrite) that has a field pH of 4 or more (1:5 soil:water).
<b>Register of the National Estate</b>	A list of the National Estate developed under the provisions of the Commonwealth's Australian Heritage Commission Act 1975.
<b>risk</b>	Likelihood of a specific undesirable event occurring within a specified period or in specified circumstances. Listed as a frequency or probability.

## Glossary

<b>risk assessment</b>	A process used to determine whether people and the environment are at risk (e.g. health and safety) from exposure to hazardous substances used or produced (mainly in an industrial or work place) so that appropriate control measures or management practices can be introduced to prevent or minimise the risk.
<b>security fence</b>	A fence designed to prevent unlawful intrusion to a prohibited area.
<b>sediment/detention pond</b>	Artificial earthen depression to retain water runoff for a period of time so as to control high intensity runoff.
<b>sustainable use</b>	Use of organism, ecosystem or their renewable resource at a rate within its capacity for renewal.
<b>TAPM</b>	The Air Pollution Model is an air quality dispersion model developed by the Commonwealth Scientific Investigation & Research Organisation.
<b>terrestrial</b>	Of or pertaining to the land as distinct from the water.
<b>thermal efficiency</b>	The proportion of energy converted from the fuel to electricity in the generation process is an indication of CO <sub>2</sub> emissions.
<b>total aromatic hydrocarbons</b>	A class of organic chemicals which contain an aromatic ring (e.g. benzene, anthracene, naphthalene and their derivatives). Used in chemical and pharmaceutical industries.
<b>total organic carbon (TOC)</b>	The amount of carbon in the organic form contained in a sample, measured as a percentage.
<b>total suspended solids (TSS)</b>	Total load of particulates in water, measured in mg/L.
<b>turbidity</b>	Liquid's ability to intercept light. Measured in nephelometric turbidity units (NTU). Cannot be consistently correlated with the concentration of suspended matter.
<b>visibility</b>	Measure of extent to which particular components of a development may be visible from surrounding areas.
<b>visual absorption capacity</b>	An estimation of the capacity of the landscape to absorb development without creating a significant change in visual character or producing a reduction in scenic quality.
<b>volatiles</b>	Any chemical compound which will evaporate quickly due to its low boiling point.
<b>vulnerable species</b>	Those that may soon become endangered unless action is taken.
<b>waders</b>	Synonymous with shorebirds.
<b>weed</b>	Naturalised, non-indigenous plant species which may be noxious weeds (or agriculture), environmental weeds or any other generally undesirable introduced species.
<b>wetlands</b>	Areas largely inundated with water, yet offering elevated land as a habitat for wildlife, notably waterfowl. Can be landlocked.

## Glossary

**wind climate**

A description of the meteorological conditions created by the wind involving measurements of wind speed, direction and frequency of gusts for average, seasonal and annual conditions.