APPENDIX 6

Boco Rock Wind Farm Landscape and Visual Impact Assessment

Green Bean Design landscape architects

Boco Rock Wind Farm

LANDSCAPE & VISUAL IMPACT ASSESSMENT

Prepared for:

WIND PROSPECT CWP PTY LTD

September 2009

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Boco Rock Wind Farm

LVIA

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Introduction

SECTION 1

1.1 Introduction

The Boco Rock wind farm Landscape and Visual Impact Assessment (LVIA) has been prepared by Green Bean Design Landscape Architects on behalf of Wind Prospect CWP Pty Ltd (the Proponent).

The LVIA addresses one of the key requirements of the Boco Rock wind farm Environmental Assessment to be submitted and assessed under Part 3A Major Projects of the Environmental Planning & Assessment Act 1979(EP&A Act).

A small number of ancillary structures, including a 132kV overhead transmission line connection between the wind farm and an existing Country Energy transmission line, will be subject to a separate and detailed landscape and visual impact assessment for approval under Part 5 of the EP&A Act.

The LVIA methodology adopted by Green Bean Design has been applied to a number of similar projects assessed by the New South Wales Department of Planning and approved under Part 3A Major Projects, including wind farms and other large infrastructure developments.

The LVIA addresses and responds to the Director General's Requirements for the assessment of potential landscape and visual impacts, and is not aware of any additional planning instruments, adopted by Bombala Council or the Cooma-Monaro Shire Council, which relate specifically to the landscape or visual impact assessment of wind farms or wind power generation. Nonetheless, the LVIA includes a thorough assessment of the potential landscape and visual impacts that meet, and generally exceed, the level of information required by existing wind farm Development Control Plans (for example those adopted by the Snowy River, Upper Lachlan Shire and Glen Innes Councils), to address potential landscape and visual impacts associated with wind farm developments.

The LVIA is not aware of any areas of landscape within the immediate wind farm viewshed that may be subject to any Local, State or Federal statutory designations for high landscape values or scenic quality and/or scenic protection.

The LVIA is cognisant of the Australian Wind Energy Association and Australian Council of National Trust's publication Wind Farms and Landscape Values National Assessment Framework, June 2007, and encompasses the general assessment framework outlined in the National Assessment Framework.

The LVIA involved a comprehensive evaluation of the landscape character in which the Boco Rock wind farm and ancillary structures would be located, and an assessment of the potential landscape and visual impacts that may result from the construction and operation of the wind

farm, taking into account appropriate mitigation measures. The LVIA is based on technical and design information provided by the Proponent to Green Bean Design.

The Proponent is considering two alternative design layouts for the Boco Rock wind farm, although each design layout would generally occupy a similar extent of ridgeline areas. The LVIA references each alternative design as the '125' or '107' design layout. As the references suggest, the '125' design layout incorporates a total of 125 wind turbines, and the '107' design layout, a total of 107 wind turbines.

Although there is a general overlap between the turbine locations within the alternative design layouts, the LVIA has assessed and determined the potential landscape and visual impacts associated with each of the design layouts. The main difference between the '125' and '107' wind turbine specifications relates to the diameter of the rotor blades, and is outlined in **Section 3** of the LVIA.

The '125' and '107' design layouts supersede the '127' and '109' design layouts outlined and described the in the Proponent's Preliminary Environmental Assessment dated 15th May 2009. The LVIA includes the Capital Hill wind farm bench mark study originally prepared for the '127' and 109' design layout. The bench mark study figures were presented at the Nimmitabel public open day and have been retained for comparative purposes and included in **Appendix B** of the LVIA report.

The LVIA also includes a Zone of Visual Influence (ZVI) diagram to compare the visibility of the superseded '127' design layout (with 80m high towers) with the proposed '125' design layout (with 100m high towers), again for comparative purposes and illustrated in **Figure 20**.

The '125' and '107' design layouts would utilise wind turbines generators with nominal capacities for 2MW and 3MW respectively. The general design parameters for '125' and '107' wind turbines are detailed and illustrated in the LVIA. The final selection of an appropriate turbine model would be made at the detailed design stage.

The LVIA has adopted the renaming of the Ando Road, which is referred to as the Snowy River Way. Those landowners hosting wind turbines are referred to as 'associated landowners' throughout the LVIA.

1.2 Methodology

The LVIA methodology included the following activities:

- Desktop study addressing visual character and identification of receptor locations within the surrounding area;
- Fieldwork and photography;
- Preparation of ZVI diagrams;

- Assessment and determination of landscape sensitivity;
- Assessment and determination of visual impact;
- Preparation of photomontages and illustrative figures;
- Preparation of shadow flicker assessment; and
- Preparation of a bench mark study.

1.3 Desktop study

A desktop study was carried out to identify an indicative viewshed for the Boco Rock wind farm. This was carried out by reference to 1:25,000 scale topographic maps as well as aerial photographs and satellite images of the project area and surrounding landscape. A preliminary ZVI diagram was also produced prior to the commencement of fieldwork in order to inform the likely extent and nature of areas within the nominated viewshed of the proposed wind farm.

Topographic maps and aerial photographs were also used to identify the locations and categories of potential receptors that could be verified during the fieldwork component of the assessment. The desktop study also outlined the visual character of the surrounding landscape including features such as landform, elevation, landcover and the distribution of settlements.

1.4 Fieldwork

The fieldwork involved:

- A five day site inspection (over two visits) to determine and confirm the potential extent of visibility of the Boco Rock wind farm and ancillary structures;
- Determination and confirmation of the various receptor categories and locations from which the Boco Rock wind farm and ancillary structures could potentially be visible; and
- Preparation of a record for each receptor location inspected and assessed.

1.5 Assessment of Landscape Sensitivity

The potential impact of the Boco Rock wind farm on the sensitivity of the landscape surrounding the wind farm would result primarily from the capability of the landscape to integrate with, or to accommodate the wind farm.

The capability of the landscape to accommodate the wind farm would result primarily from the nature and degree of perceptual factors that can influence interpretation and appreciation of the landscape, including landform, scale, topographic features, landcover and human influence or modifications.

1.6 Assessment of Visual Impact

The potential visual impact of the wind farm on surrounding receptors would result primarily from a combination of the potential visibility of the wind turbines and the characteristics of the landscape between, and surrounding, the receptors and the wind farm. The potential degree of visibility and resultant visual impact may be partly determined by a combination of factors including:

- The category and type of situation from which receptors may view the wind farm (examples of receptor categories include residents or motorists);
- The visual sensitivity of receptors surrounding the wind farm;
- The potential number of receptors with a view toward the proposed wind farm from any one location;
- The distance between the receptor and the wind farm; and
- The duration of time the receptor may view the wind farm from any particular static or dynamic view location.

An underpinning rationale for the LVIA is that if receptors are not normally present at a particular location, such as agricultural pasture areas, or they are screened by landform or vegetation, then there is likely to be a nil visual impact at that location.

If, on the other hand, a small number of receptors are present for a short period of time at a particular location then there is likely to be a low visual impact at that location, and conversely if a large number of receptors are present then the visual impact is likely to be higher.

Although this rationale can be applied on a broad scale, the LVIA also considers, and has determined, the potential visual impact for individual receptor locations that may have a higher degree of sensitivity to the wind farm development, including the potential impact on individual residential dwellings situated in the surrounding landscape. The determination of a visual impact is also subject to a number of other factors which are considered in more detail in the LVIA.

Whilst the LVIA addresses a number of static elements associated with the Boco Rock wind farm, the assessment acknowledges and has considered the potential visual impact associated with the movement of the wind turbine rotors.

1.7 Photomontages

A total of nine photomontages were prepared by Garrad Hassan Pacific Pty Ltd to illustrate the potential visibility of the ‘125’ and ‘107’ design layouts following construction.

Seven locations were selected for the preparation of photomontage, and included views from the vicinity of residential properties and surrounding road corridors. The photomontages locations are illustrated in **Figure 23** and the photomontages in **Figures 24** to **32**.

1.8 Shadow Flicker & Blade Glint

Garrad Hassan Pacific Pty Ltd prepared a shadow flicker assessment and report for the Boco Rock wind farm '125' and '107' design layouts. The results of the shadow flicker assessment are summarised in the LVIA report, with the detailed report for the '107' design layout included in full in the LVIA **Appendix A**.

1.9 Capital Hill Wind Farm, Bench Mark Study

The photomontages have been prepared with an industry standard computer software program 'GH Windfarmer'. This software program has been specifically designed for windfarm analysis and development. In order to verify the technical accuracy of the photomontages a bench mark study was carried out to compare the scale of the wind turbines illustrated in the photomontages against the scale of wind turbines in photographs of a constructed windfarm in New South Wales. A summary of the bench mark study is included in the LVIA **Appendix B**.

The bench mark study was originally prepared for the superseded '127' design layout which included wind turbines mounted on 80m high towers, and was compared to the wind turbines constructed at the Capital Hill wind farm also mounted on 80m high towers. There are currently no known constructed wind turbines mounted on 100m high towers in New South Wales, and as such there is limited opportunity to update the bench mark study; however, the bench mark study is considered to provide a relative comparison of the process used to create the photomontages and is therefore considered appropriate to verify the procedure used to generate the photomontages for the current wind turbine design layouts.

Figures 33 and **34** illustrate the Capital Hill bench mark study prepared for the Nimmitabel community consultation open day and are included in the LVIA for information purposes only.

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Location

SECTION 2

2.1 Location

The Boco Rock wind farm would be located in the south east of New South Wales within the Monaro sub-region of the Southern Tablelands, around 38km south of Cooma and 6km southwest of Nimmitabel. Canberra is approximately 150km to the north of the project area, with the Victorian border approximately 48km to the south and beyond Bombala. The general location of the Boco Rock wind farm is illustrated in **Figure 1**.

The Snowy Mountain Range is visible as a long distance view from some elevated points surrounding the wind farm project area. Mount Kosciusko is around 74km to the west of the project area, and at this distance, the Boco Rock wind farm is unlikely to be visible from either Mount Kosciusko or other elevated portions of the Snowy Mountain Range. The visibility and clarity of the Snowy Mountain Range from elevated areas surrounding the wind farm project area are subject to prevailing climatic conditions on any particular day of the year, with rain or cloud cover tending to reduce the level of overall visibility.

The Boco Rock wind farm project area would extend across seventeen participating rural residential and farming properties covering an area around 11,700 hectares, administered by the Cooma-Monaro Shire Council and Bombala Council.

The Cooma-Monaro Shire covers around 523,000 hectares covering large tracts of pastoral tree-less grassy plains and forested hills. The Bombala Council area covers approximately 395,000 hectares of the Monaro Plains in the south east portion of the New South Wales Tablelands. The footprint of the Boco Rock wind farm project would occupy a very small portion of both Councils administered areas.

The ‘125’ and ‘107’ wind turbines are located along a series of ridgelines, to the north, south and west of the Maclaughlin River valley. The longest extent of ridgeline occupied by wind turbines extends for approximately 15km along the Sherwin Range on the western extent of the project area.

The wind turbines are generally located in four discrete groups, and for the purpose of the LVIA have been identified as the:

- ‘Yandra’ group to the north of the Maclaughlin River and east of Boco Creek;
- ‘Springfield’ group south of the Maclaughlin River and north of Garlands Creek;
- ‘Boco’ group to the north west of the Maclaughlin River and west of Boco Creek; and
- ‘Sherwins’ group to the west of the Maclaughlin River.

There is, however, a certain degree of intervisibility between the turbine groups where, in some areas they are only separated by around 1km. The LVIA assessment has considered

the potential landscape and visual impact from the Boco Rock wind farm as a whole, as well as by reference to individual groups.

The eastern extent of the Boco Rock wind farm is located approximately 6km from Nimmitabel, a rural village on the edge of the Southern Tablelands. Settled around 1839, Nimmitabel had a population of 238 people as of the 2001 Census, residing either side of the Monaro Highway which passes through the centre of the town. An additional and similar number of people live in the general district of Nimmitabel.

Nimmitabel contains a small number of historic and diverse built structures, which are still largely connected by the original fabric of urban development that established following settlement in the area. The more notable buildings include:

- The Old Mill;
- Police Station and lockup;
- St Andrew's Catholic Church and St Joseph's Convent and School ;
- Methodist Church;
- Uniting Church; and
- Nimmitabel Pioneer Cemetery.

Nimmitabel was also used as one of the filming locations for the 1959 film The Sundowners. Although there are no dedicated public lookouts within Nimmitabel, there are some opportunities to obtain views toward the eastern extent of the wind farm site from elevated locations around the town. These include Kirke Street around St Andrew's Catholic Church as well as Clarke Street from the street frontage of the Old Flour Mill.

Views toward the wind farm from the majority of the town would be restricted or screened by landform rising to the south west, as well as vegetation and buildings within the town, and it is considered that the Boco Rock wind farm would be unlikely to have a direct or significant impact on the immediate visual qualities of Nimmitabel.

There are a number of nature reserves in the landscape surrounding the wind farm, the majority having been transferred to NSW National Parks in 2001 as part of the Southern Region Forest agreement. A collection of nature reserves, referred to as the Central Monaro reserves, are located to the west and north west of the wind farm and include:

- Ironmungy Nature Reserve
- Myalla Nature Reserve
- Bobundara Nature Reserve
- Wullwye Nature Reserve

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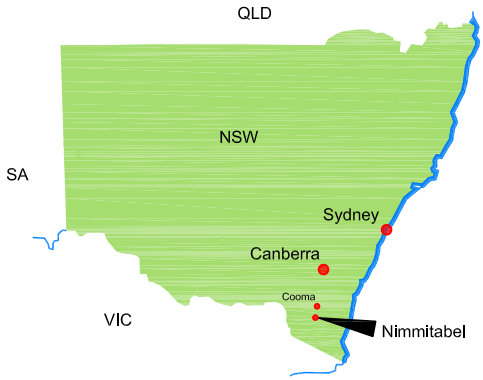
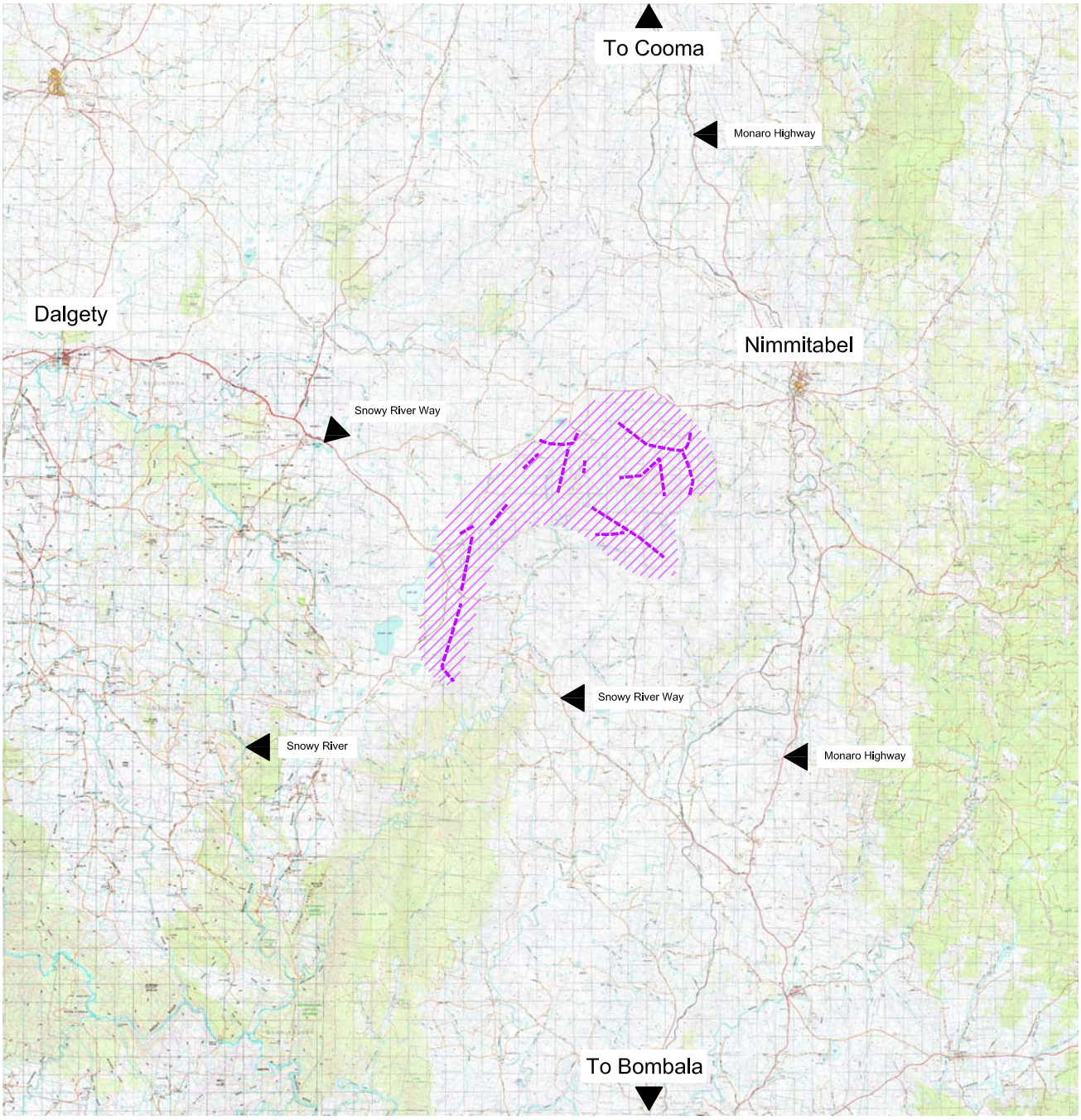


LEGEND

GENERAL LOCALITY

INDICATIVE EXTENT OF RIDGELINE SUPPORTING WIND TURBINES



BOCO ROCK WIND FARM - LOCATION PLAN

Source: Copyright Department of Lands
Panorama Avenue Bathurst 2795
(www.lands.nsw.gov.au)

0m 2Km 5Km

N

BOCO ROCK WINDFARM

Fig 1 - Location Plan

The nature reserves are relatively small, and the NSW National Parks Draft Plan of Management prepared for the Central Monaro reserves suggest that public access to the reserves is either limited, largely restricted or that there is very little use by the community.

The Merriangaan Nature Reserve, located to the south of the wind farm, is also noted as having no formal public access arrangements.

It is not anticipated that the wind farm would have any significant impact on views from within or beyond any of the nature reserves identified in the surrounding landscape.

There are a small number of National Parks adjoining the Monaro region. They include the Kosciusko National Park (Wilderness Area), South East Forest National Park and the Wadbilliga National Park. The influence of distance, landcover and topography between these National Parks and the wind farm site would be unlikely to result in any landscape or visual impact issues.

The railway, between Cooma and Bombala, arrived in 1912 but was closed in 1988.

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3.1 Project description

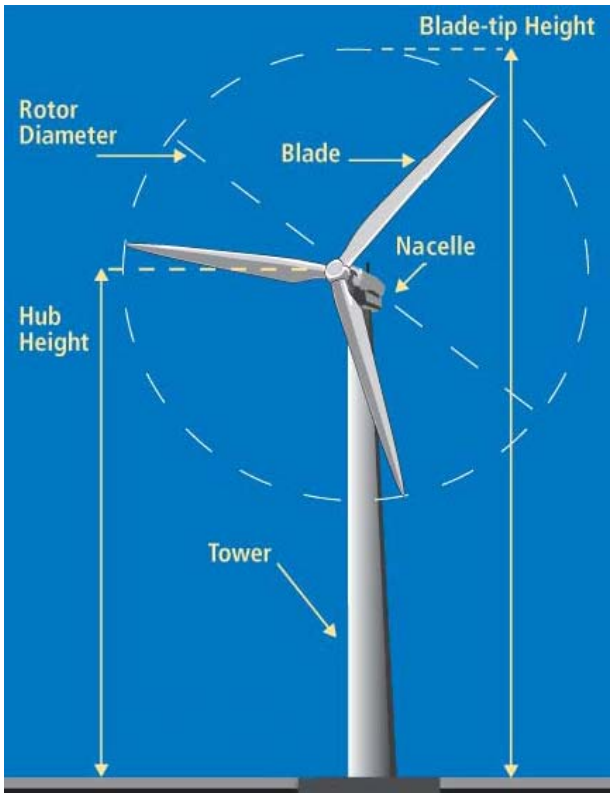
The primary visual components of the Boco Rock wind farm would comprise:

- Up to one hundred and twenty five wind turbines;
- Up to four wind monitoring masts;
- On site access tracks for construction, operation and ongoing maintenance;
- Control and facilities building;
- A collector substation;
- Interconnecting 33kV overhead electrical lines;
- A 132kV double-circuited transmission line (connecting the Boco Rock substation and the existing Country Energy 132kV transmission line); and
- Wind farm signage.

Temporary works associated with the construction of the wind farm that may be visible during construction and operational phases include:

- Crane hardstand areas; and
- Mobile concrete batching plant and rock crushing facilities.

The following diagram identifies the main components of a typical wind turbine:



Configuration and components of a typical wind turbine

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3.2 Wind turbines

The Boco Rock wind farm has been modelled on two potential design layouts. The first design layout is for up to 125 wind turbines with a nominal capacity of 2MW, with the second design layout for up to 107 wind turbines with a nominal capacity of 3MW.

The design layouts illustrated in **Figure 2** generally demonstrate the similarity in location between the '125' and '107' wind turbines, and that potential impacts are more likely to result from differences between the design parameters of each wind turbine model rather than their specific location within the project area.

The specific elements of the wind turbines comprise:

- Concrete foundations;
- Tubular tapering steel towers;
- Nacelles at the top of the tower housing the gearbox and electrical generator;
- Rotors comprising a hub (attached to the nacelle) with three blades; and
- Three fibreglass blades attached to each hub.

Tables 1 and **2** outline the main design parameters for each the proposed design layouts:

Table 1 '125' design layout – 2.1MW wind turbine:

Element	Description
Tower height	100m
Rotor Diameter	92m
Overall height from ground level to tip of blade	146m
Proposed number of wind turbines	**125**

Table 2 '107' design layout - 3.3MW wind turbine:

Element	Description
Tower height	100m
Rotor Diameter	104m
Overall height from ground level to tip of blade	152m
Proposed number of wind turbines	**107**

A visual comparison between the nominal 2MW and 3MW wind turbines is illustrated in **Figure 3**.

Table 3 outlines the number of wind turbines proposed within each turbine group for the '125' and '107' design layouts.

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LEGEND

WIND TURBINES - '125'
INDICATIVE DESIGN LAYOUT

WIND TURBINES - '107'
INDICATIVE DESIGN LAYOUT

PROPOSED COLLECTOR SUBSTATION
INDICATIVE LOCATION

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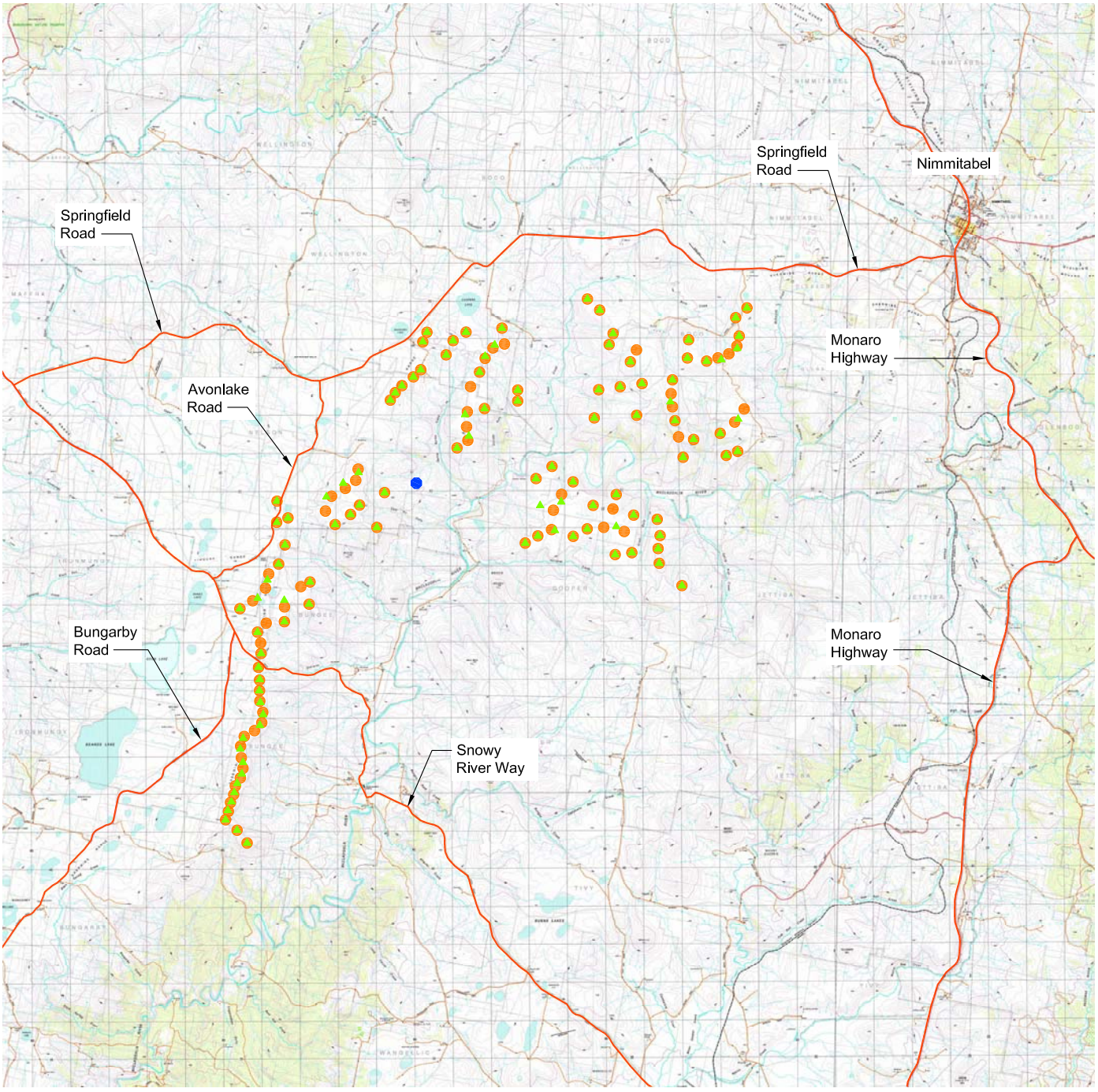

BOCO ROCK WIND FARM - '125' AND '107' INDICATIVE DESIGN LAYOUT

Source: Copyright Department of Lands
Panorama Avenue Bathurst 2795
(www.lands.nsw.gov.au)

0m 1Km 2Km

N

BOCO ROCK WINDFARM

Fig 2 - Design Layout

Table 3 – Wind Turbine Groups

Turbine group	'125' layout option	'107' layout option
'Yandra'	32	27
'Springfield'	23	20
'Boco'	23	21
'Sherwins'	47	39
Total	**125**	**107**

3.3 Wind Monitoring Masts

Up to four wind monitoring masts would be installed on-site, extending to around 85m in height. The wind monitoring masts would be of a guyed, narrow lattice or tubular steel design.

The wind monitoring masts would be unlikely to create a significant visual impact, and are similar in scale, or smaller than a number of surrounding communication masts visible in the landscape surrounding the wind farm project area.

3.4 On-site access tracks

On-site access tracks would be constructed to provide access to turbine locations across the site during construction and operation, as well as access to the control building and substation. During construction the majority of access tracks would be approximately 12m wide to allow for vehicle manoeuvring, and reduced to 6m wide to facilitate access for maintenance vehicles during the operational phase.

The final access track design would be developed on a number of environmental grounds, including minimising the potential for visual impact by considering:

- the overall length and extent;
- the need for clearing vegetation;
- the potential for erosion;
- the extent of cut and fill; and
- the potential to maximise rehabilitation at the completion of the construction phase.

3.5 Electrical cabling

The majority of cabling works, including the installation of control cables linking the turbines to the control building and cables linking the turbines to the substation, would be installed underground. For electrical reasons some cabling may be required to be installed on medium voltage overhead transmission lines supported by single low profile tubular poles.

3.6 Substation, Control Building and 33kV overhead electrical lines

Subject to detail design, the collector substation and control building would be located in the north- west portion of the project area on an east facing slope at around 900m AHD. Located to the north of Coal Pit Gully, the substation and control building are unlikely to be generally visible from the receptor locations assessed in the LVIA. The final design, including the selection of materials and colour finishes would take into account the visual and physical characteristics surrounding rural environment.

3.7 132kV overhead transmission line

Electricity generated by the Boco Rock wind farm would be connected to the grid via an overhead double circuited 132kV transmission line extending and connecting to an existing 132kV Country Energy transmission line to the east of the Boco Rock wind farm. The final alignment of the proposed 132kV transmission line is subject to ongoing site assessment and detailed engineering design. The 132kV transmission line would be subject to a separate detailed assessment and approval under Part 5 of the EP&A Act.

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LEGEND

WIND TURBINE - '125'
INDICATIVE SWEPT PATH

WIND TURBINE - '107'
INDICATIVE SWEPT PATH

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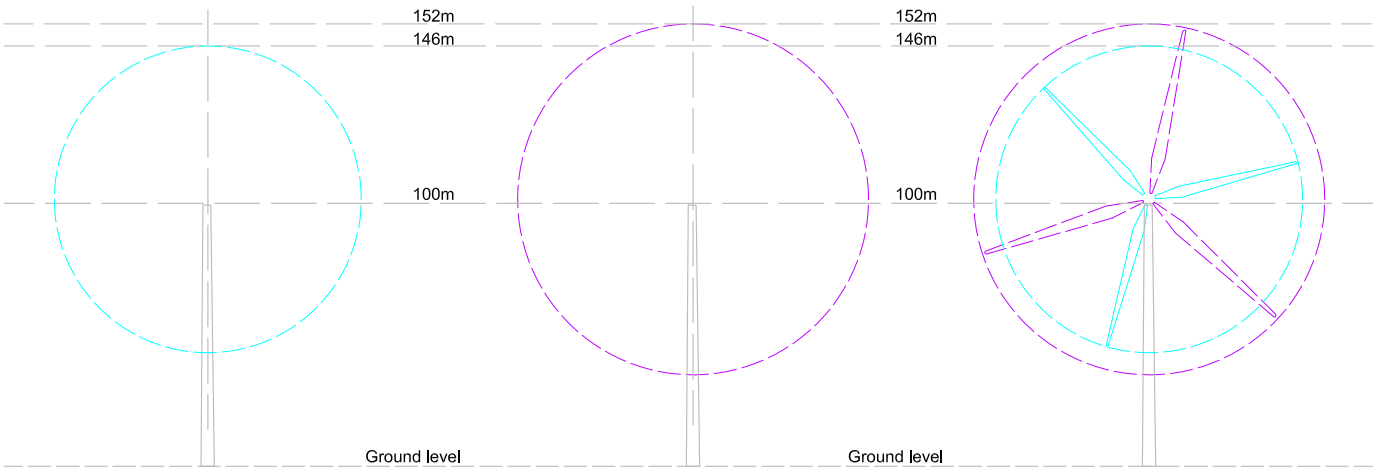
WIND PROSPECT
CWP



Detail 1: Typical illustration, 2.1MW turbine structure for the '125' turbine layout:

Tower height to hub: 100m
Rotor diameter: 92m

Detail 2: Typical illustration, 3MW turbine structure for the '107' wind turbine layout:

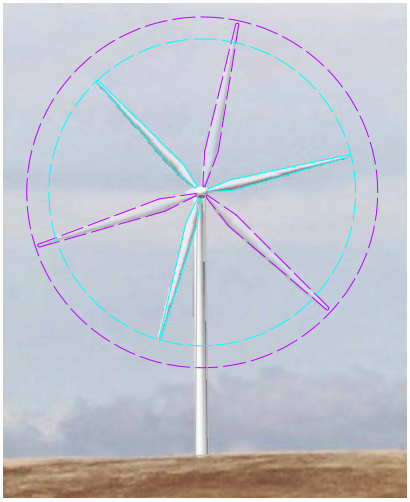
Tower height to hub: 100m
Rotor diameter: 104m

Detail 3: Typical illustration depicting the 2.1MW '125' and 3MW '107' wind turbines as a single overlay at around 2.5km distance for comparative purposes.

Tower height to hub: 100m
Rotor diameter '125' design layout: 92m
Rotor diameter '107' design layout: 104m

Detail 4: Photo illustration, typical 2.1MW turbine structure for the '125' design layout at around 2.5km distance.

Detail 5: Photo illustration, typical 3MW turbine structure for the '107' design layout at around 2.5km distance.



Detail 6: Photo illustration depicting the 2.1MW '125' and 3MW '107' wind turbine models as a single overlay at around 2.5km distance for comparative purposes.

BOCO ROCK WINDFARM

Fig 3 - Turbine comparison

Local Environmental Factors

SECTION 4

4.1 Climatic and Atmospheric Conditions

Local climatic and atmospheric conditions have the potential to influence the visibility of the Boco Rock wind farm from surrounding receptor locations, and more significantly, from distant receptor locations.

The Monaro climate is generally categorised as sub-alpine, with long cold winters and temperatures regularly falling below freezing. Periodic snowfalls can occur throughout the Monaro region. The Snowy Mountains tend to create a rain shadow effect which can create low and irregular annual rainfall across the Monaro region.

The Bureau of Meteorology has collected meteorological data over the past ten years at the Nimmitabel Wastewater Treatment Facility which indicates that there are:

- 102 clear days (annual mean average)
- 118 cloudy days,(annual mean average)
- 81 days of rain (annual mean average)

Rainfall would tend to reduce the level of visibility toward the Boco Rock wind farm from a number of surrounding receptor locations, with the degree of visibility tending to decrease over distance. Rain periods may also reduce the number of visitors travelling through the areas from which the Boco Rock wind farm may be visible, and potentially decrease the duration of time spent at a particular public receptor location with a view toward the Boco Rock wind farm.

Cloud cover would also tend to reduce the level of visibility of the Boco Rock wind farm and lessen the degree of contrast between the wind turbine structures and the background against which the wind turbines may be visible.

On clear or partly cloudy days, the position of the sun would also have an impact on the degree of visibility of the Boco Rock wind farm. The degree of impact would be largely dependent on the relationship between the position and angle of the sun relative to the receptor location. Late afternoon and early evening views toward the west would result in the wind turbines silhouetted above the horizon line, and with increasing distance would tend to reduce the contrast between the wind turbine structures and the surrounding landform.

4.2 Topography and Drainage

The Boco Rock wind farm would be located on the southern portion of the Monaro Tablelands, part of a larger tableland adjacent to the Snowy Mountains and Alpine region of southern New South Wales. The geology of the area generally consists of granitic deposits,

with basaltic soils across portions of the project area together with deposits of sands and sandstone limited to sections of the Maclaughlin River environment.

The Boco Rock wind farm is generally contained by the Sherwin Range extending north south along the western boundary of the project area, the Square Range to the east, and the main Jettiba ridgeline extending east to west to the south of the project area. The ranges and main ridgeline heights extend between 1130m and 1180m Australian Height Datum (AHD).

The topography across the wind farm project area is generally characterised by a series of simple ridgelines and spurs, with a small number of solitary hilltops occurring throughout the project area. The topography is also significantly influenced by the Maclaughlin River and a number of smaller creeks draining toward it. Each turbine group is physically separated by a creek line cutting and dividing the landform between them, including Teapot Creek, Gentle Barlow Creek, Boco Creek and McDonalds Creek. The Maclaughlin River follows a meandering course east to west from the east of the Monaro Highway, before turning south to south west and flowing toward the confluence with the Snowy River at Merriangah.

The east west section of the river valley that extends through the project area is generally confined by adjoining steep sided slopes rising north and south to the ridgelines supporting the ‘Yandra’ and ‘Boco’ turbine groups. The river extends west beyond the ‘Boco’ turbine group before turning south. The base of the river valley begins to broaden before passing below the Alan Caldwell bridge at the Snowy River Way. The landform rises gently to the west of the river before steepening and rising to the top of the Sherwin Range.

The landscape within and surrounding the wind farm project area contains a number of prominent hills, including:

- The Peak (around 413m AHD);
- Jettiba (around 1133m AHD);
- Coopers Hill and Mount Cooper (around 1000m AHD);
- Moodies Hill (1023m AHD);
- Bungarby Hill (1042m AHD);
- Teapot Hill (around 1042m AHD); and
- Nimmitabel Hill (around 1172m AHD).

The ‘Yandra’ turbine group is located on a hilltop west of McDonald’s Creek, extending along a number of ridgelines to the north, south and west. The wind turbines are located between the 900m and 1000m AHD, with the base of the highest wind turbine located on the hilltop at around 1100m AHD.

The ‘Boco’ turbine group is located on an extended spur running north-west from the prominent Jettiba ridgeline. The wind turbines are located across the broad top of the spur, generally situated above the 900m AHD contour.

The ‘Springfield’ turbine group, located in the north west portion of the project area, is partially located on a ridgeline extending south between Gentle Barlow Creek and Scrubby Gully, with the remainder of the turbine group extending west and south above the Gentle Barlow Creek gully. The wind turbines are generally situated above 900m AHD, extending to the 1000m AHD south of Coopers Lake and west of Gentle Barlow Creek.

The ‘Sherwins’ turbine group, located along the western portion of the wind farm project area, runs along a north south ridgeline on the Sherwin Range. The ridgeline is generally more visually prominent approaching from the east along the Snowy River Way, and from the Maclaughlin River valley. The top of the ridgeline is generally level, with the turbines situated above 1100m AHD.

The landform to the west of Sherwins Range extends across a narrow plateau that contains a small series of upland lakes, before falling away to the west and north west between gullies and creek lines flowing to the Snowy River.

Hilltops and prominent ridgelines within and surrounding the wind farm project area are illustrated in **Figure 4**.

4.3 Vegetation

The extent and condition of vegetation across the wind farm project area has been assessed and is detailed in the flora and fauna studies prepared for the Environmental Assessment and for the purpose of the LVIA are discussed in general below.

The predominant groundcover vegetation type across the wind farm project area is a semi improved grass pasture with some limited areas of temperate montane grassland. Areas of grassland are generally open, crossing gently undulating, sloping and ridgeline areas. The majority of grassland has limited tree cover, more noticeably sparse beyond the western portions of the project area.

Trees in the western portion of the project area are largely restricted to drainage lines and areas of cultivated plantings for windbreaks around residential properties and farm buildings. There is some scattered tree cover, as well as areas of denser tree vegetation to the south of the ‘Yandra’ turbine group north of the Maclaughlin River. Scattered tree cover continues to the east of the project area, including areas along Springfield Road.

The pre-European temperate montane grassland community extended across large tracts of south east Australia, including the Monaro sub region. The extent of the temperate montane grassland declined significantly post European settlement with various estimates suggesting

that less than 10% to 2% of the pre-historical extent of grassland, with any significant ecological integrity, remains today (DEWHA 2009).

Despite being ‘naturalistic’ in appearance (or variously described as ‘pristine’), portions of the Monaro landscape have been heavily modified by agricultural improvement for pasture and arable production post European settlement in the Monaro region (Benson 1994). From the 1940’s agricultural improvements became more common with widespread use of machinery to plough and sow legumes as well as apply superphosphate fertilisers (Hancock 1972).

Despite modifications to the landscape arising from both human and natural influences, there are various programs that have been established by government and non government organisations in collaboration with local landowners to address the ecological condition of the landscape through weed control and livestock management to relieve grazing pressure.

Irrespective of the extent and nature of modifications to the landscape, it is not correct to assume that a landscape should be any less valued as a result of modification. Physical change in the appearance of the landscape is an ongoing and constant process that can have both positive and negative effects.

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LEGEND

INDICATIVE '125' DESIGN LAYOUT

RESIDENCE BETWEEN 5 TO 10KM OF WIND FARM

ASSOCIATED RESIDENCE

RESIDENCE BEYOND 10KM OF WIND FARM

RESIDENCE BETWEEN 1 TO 5KM OF WIND FARM

TOPOGRAPHIC HIGHPOINT

RIDGELINE

GREEN BEAN DESIGN
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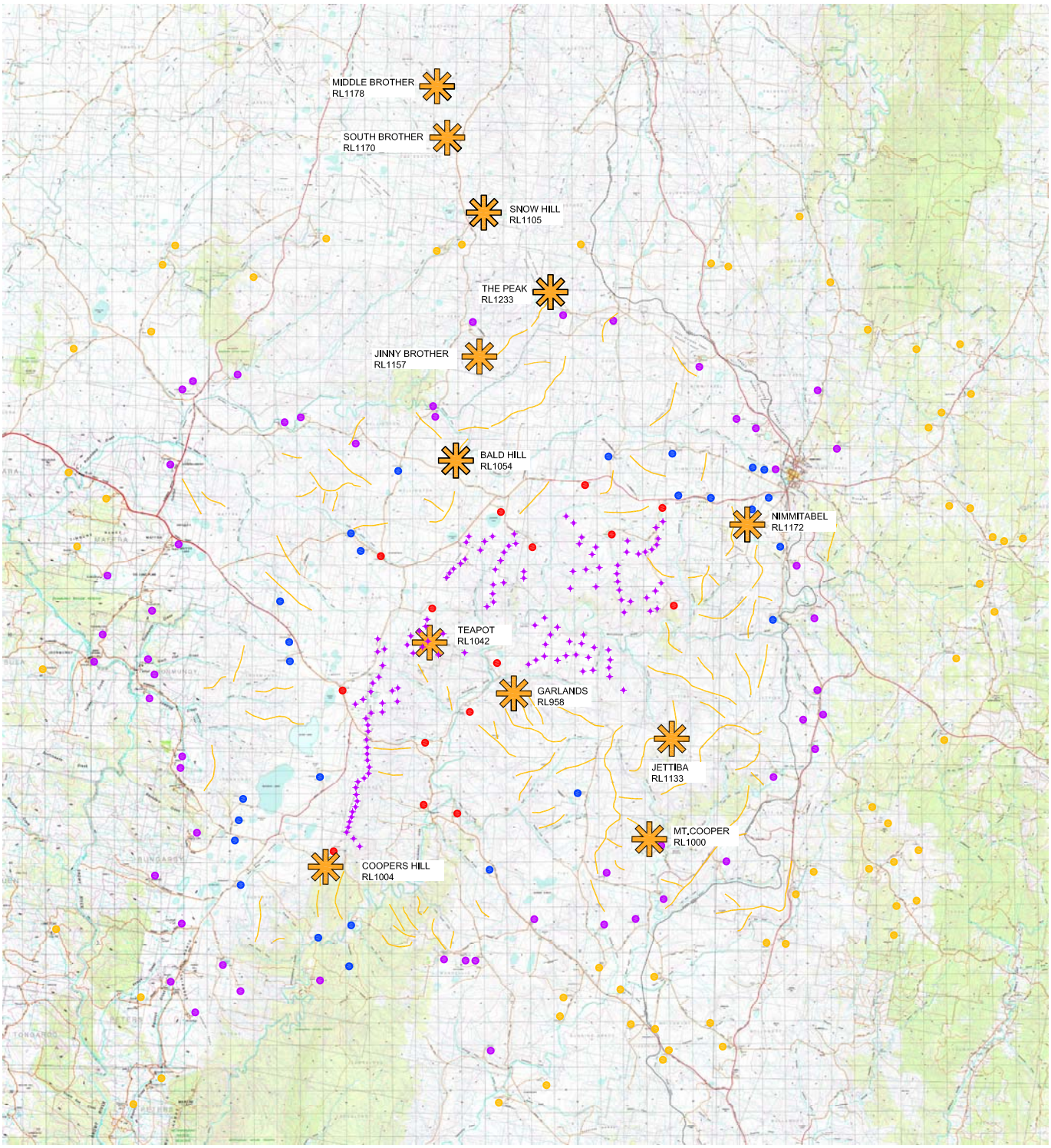
WIND PROSPECT CWP



BOCO ROCK WIND FARM - TOPOGRAPHY

Source: Copyright Department of Lands
Panorama Avenue Bathurst 2795
(www.lands.nsw.gov.au)

0m 2Km 5Km

N

BOCO ROCK WINDFARM

Fig 4 - Topography

Panoramic Photographs (Existing views) SECTION 5

5.1 Panoramic Photographs

A series of photographs was taken during the course of the fieldwork to illustrate existing views in the vicinity of a number of receptor locations inspected and assessed as part of the landscape and visual assessment process.

The photographs were taken with a tripod mounted digital SLR camera with a standard 50mm lens. Individual photographs were digitally stitched together to form a segmented panoramic image to provide a visual illustration of the existing view from each photo location.

The real world coordinate location for each panoramic photograph was recorded with a hand held GPS unit to an accuracy of around plus or minus two meters. Additional information including the bearing or direction of each photograph, time of day and prevailing weather conditions was also recorded.

The panoramic photographs presented in this LVIA have been annotated to identify key features or structures located within the existing view, and indicatively illustrate the general extent and location of potentially visible wind turbines or portions of turbine structures.

The panoramic photograph locations are illustrated in **Figure 5**, and the panoramic photographs illustrated in **Figures 6** to **16**.

The panoramic photographs are not to be confused with the photomontages. The panoramic photographs do not include a representation or model of the wind turbine structures. The photomontages are discussed in **Section 10** of the LVIA report, and are illustrated in **Figures 24** to **32** and included at A3 format in **Volume 2** of the Environmental Assessment.

LEGEND

WIND TURBINES - '125'
INDICATIVE DESIGN LAYOUT

RESIDENCE

B18 PANORAMIC PHOTO LOCATION

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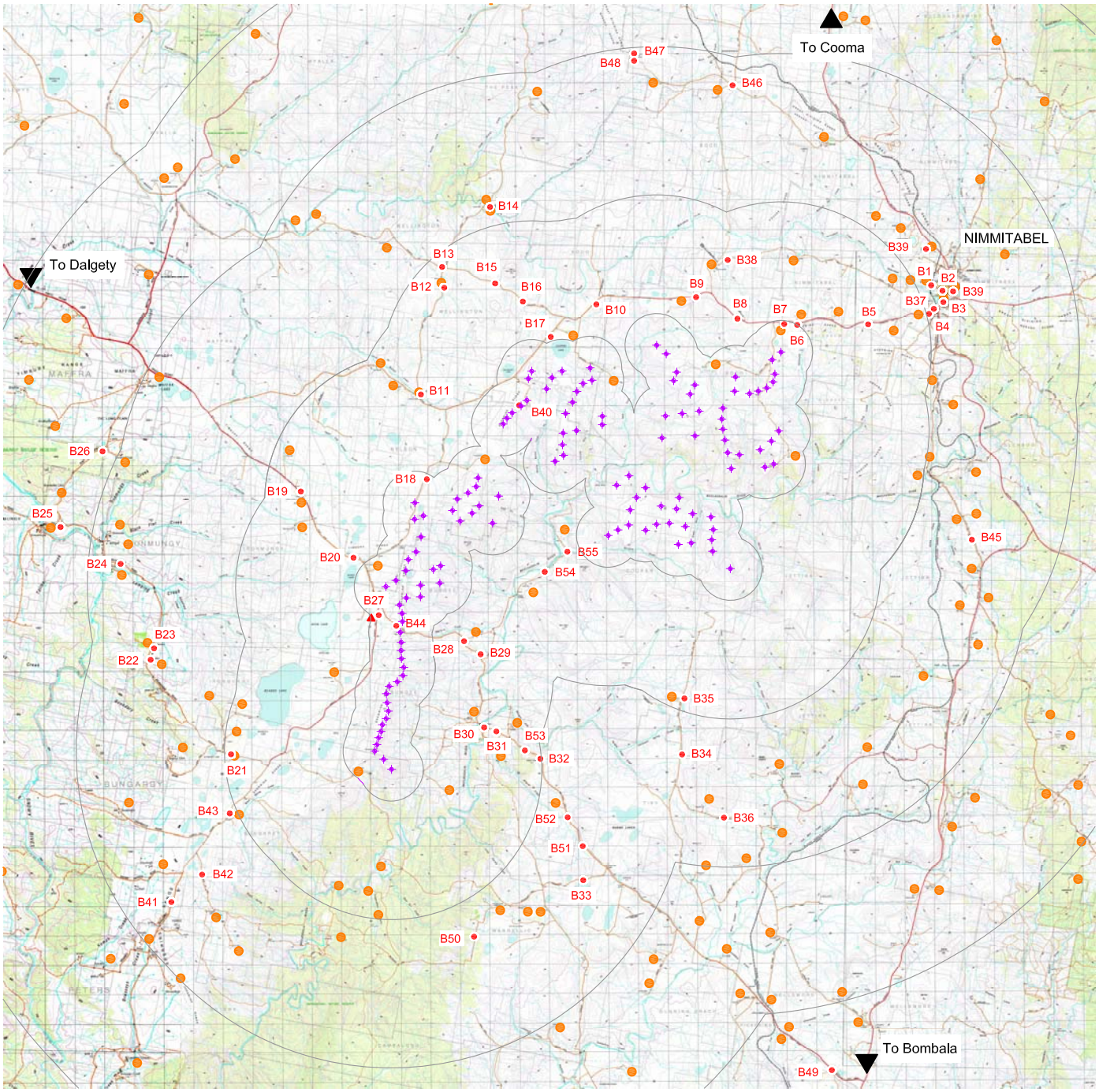

BOCO ROCK WIND FARM - PANORAMIC PHOTO LOCATIONS

Source: Copyright Department of Lands
Panorama Avenue Bathurst 2795
(www.lands.nsw.gov.au)

0m 2Km 5Km

N

BOCO ROCK WINDFARM

Fig 5 - Panoramic Photo Locations