Local Environmental Factors

SECTION 5

5.1 Climatic and Atmospheric Conditions

Local climatic and atmospheric conditions have the potential to influence the visibility of the Project from surrounding view locations, and more significantly, from distant view locations. The climate of the New South Wales South Eastern Highlands Bioregion is characterised by a temperate climate of warm summers and no dry season with elevated areas in the north and south of the bioregion experiencing milder summer conditions in montane climate zones.

The Bureau of Meteorology has collected meteorological data over the past thirty five years at the Goulburn TAFE weather station which indicates that there are:

- 88.4 clear days (annual mean average);
- 132.3 cloudy days (annual mean average); and
- 75.3 days of rain (annual mean average).

Rainfall would tend to reduce the level of visibility toward the Project from a number of surrounding view 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 Collector Wind Farm may be visible, and potentially decrease the duration of time spent at a particular public view location with a view toward the Project.

Cloud cover would also tend to reduce the level of visibility of the Project 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 Collector wind farm turbines. The degree of impact would be largely dependent on the relationship between the position and angle of the sun relative to the view 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.

Figure 6 illustrates the extent to which local weather conditions can influence the visibility of wind farm turbine structures.

5.2 Topography and Drainage

The broad topography of the Project site is gently undulating and largely indicative of the Great Dividing Range. A primary ridgeline at around 900m AHD extends north to south from Mount Cullerin with an adjoining and lower ridgeline to the east upon which the Cullerin Range is located. The main ridgelines extend to a series of lower rises, no higher than 800 m AHD with low lying areas at

PHOTO A - DAY TIME VIEW FROM HUME HIGHWAY TOWARD CULLERIN WIND FARM AT AROUND 3.5KM (13th June 2010)

PHOTO A - Illustrates the visibility of wind turbines against a clear and blue sky backdrop with sunlight from above and to the right of the wind turbines creating a shadow line along the left hand side of the towers as well as portions of the rotor blades.

PHOTO B - DAY TIME VIEW FROM HUME HIGHWAY TOWARD CULLERIN WIND FARM AT AROUND 3.5KM (10th June 2010)

PHOTO B - Illustrates the visibility of wind turbines against a partly cloudy and overcast backdrop. The wind turbines in cloud shadow appear off white to grey in colour.

PHOTO C - DAY TIME VIEW FROM HUME HIGHWAY TOWARD CULLERIN WIND FARM AT AROUND 3.5KM (7th July 2010)

PHOTO C - Illustrates the visibility of wind turbines in fog/low cloud cover.

approximately 700m AHD to the Projects east and west boundaries. The topography provides an impression of undulating rises set within an escarpment, with the southern ridgeline being the predominate feature in the landscape.

The main geology of the site is a sedimentary ridge with increasing granite to the south west. There are a number of rocky outcrops scattered through the southern portion of the Project area.

The landscape within and surrounding the Collector Wind Farm contains a number of prominent topographic features, including:

- Mount Cullerin (around 840m AHD);
- Yankee Jacks Hill (around 880m AHD); and
- Gun Gun Hill (around 893m AHD).

There are no major watercourses present within the project area; however, there are several ephemeral watercourses. These include:

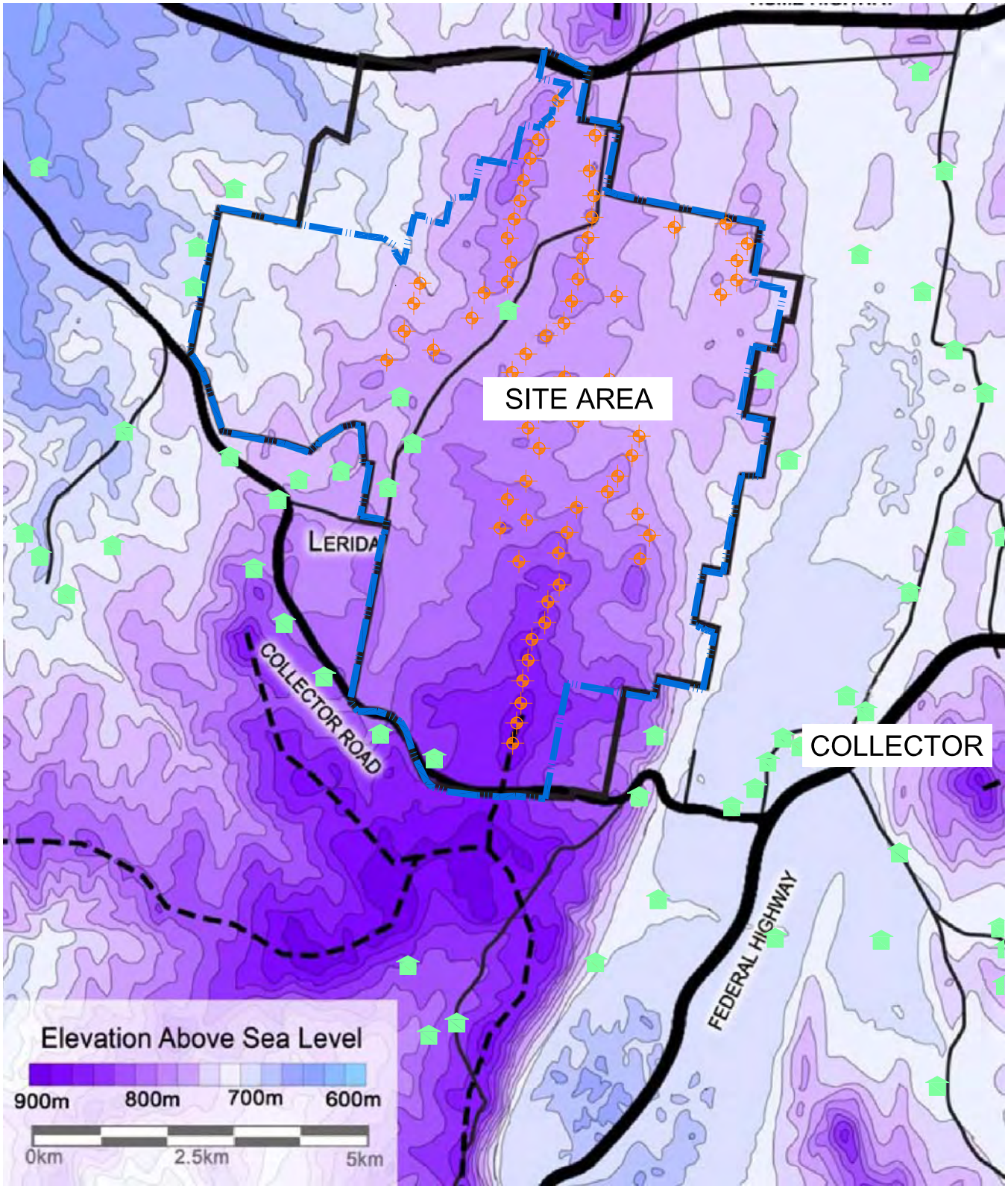
- Meadow Creek,
- Lerida Creek,
- Cullerin Creek,
- Sandy Creek,
- Frankfield Creek and
- Collector Creek.

Landform elevation within and surrounding the Project area is illustrated in **Figure 7**.

5.3 Vegetation

A detailed survey of existing vegetation has been carried out as part of the biodiversity assessment for the Collector Wind Farm EA and is summarised within the EA and detailed within the relevant EA Appendix.

In general the landscape within the Project site contains vegetation associated with woodland, drainage lines, small ponds/dams and cleared land for pasture and agricultural crop cultivation. Stands of remnant woodland occur within the wider context of a modified landscape which continues to be managed through a variety of farming activities.



Source: The Total Planning Group

LEGEND

Proposed Collector Wind Turbine and Site Boundary

Residental dwelling or structure

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COLLECTOR WIND FARM

Panoramic Photographs (Existing views)

SECTION 6

6.1 Panoramic Photographs

A series of digital photographs were taken during the course of the fieldwork to illustrate existing views in the vicinity of a number of view locations inspected and assessed as part of this LVIA.

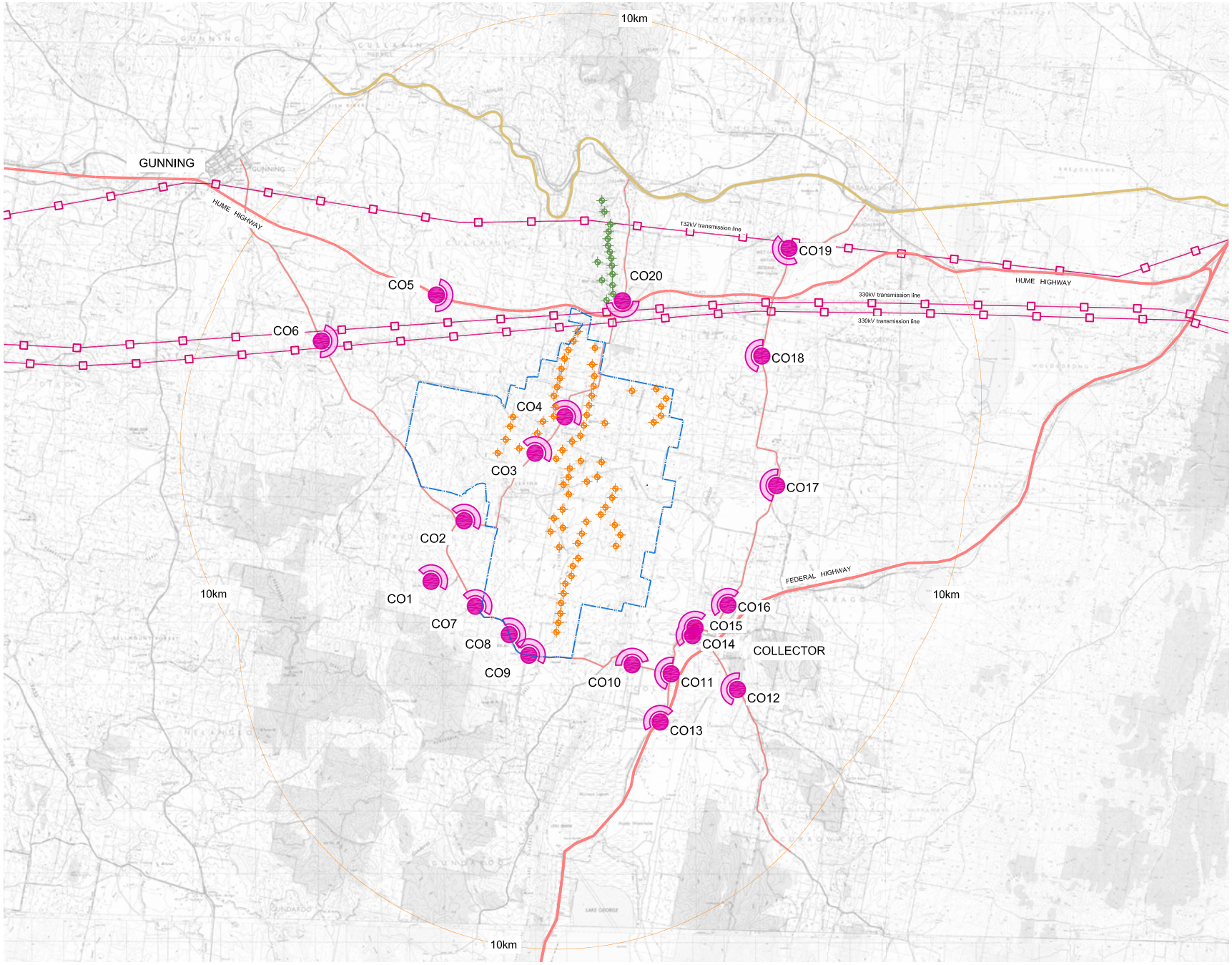
The photographs were taken with a tripod mounted digital Nikon D90 SLR camera with a prime 50mm lens. Individual photographs were digitally stitched together to form a segmented panoramic image to provide a visual illustration of the existing view from each photo location.

A GPS coordinate for each panorama photograph location was recorded with an accuracy of around +/- 4m. 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. They also indicatively illustrate the general extent and location of potentially visible wind turbines or portions of turbine structures associated with the Collector, Cullerin and Gunning Wind Farms.

The panoramic photograph locations are illustrated in **Figure 8**, and the panoramic photographs illustrated in **Figures 9** to **14**.

The panoramic photographs should not be confused with the photomontages. The panoramic photographs do not include a representation or model of the Collector wind turbine structures. The photomontages are discussed in **Section 10** of this LVIA report, and are illustrated in **Figures 20** to **26**.



Legend

- Panoramic Photo Location
- Proposed Collector turbine
- Existing Cullerin turbine
- Collector Wind Farm Site Boundary
- Highway or Local Road
- Main Southern Railway
- Existing 132/330kV transmission line

0km 4km

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

Figure 8 Photo Locations

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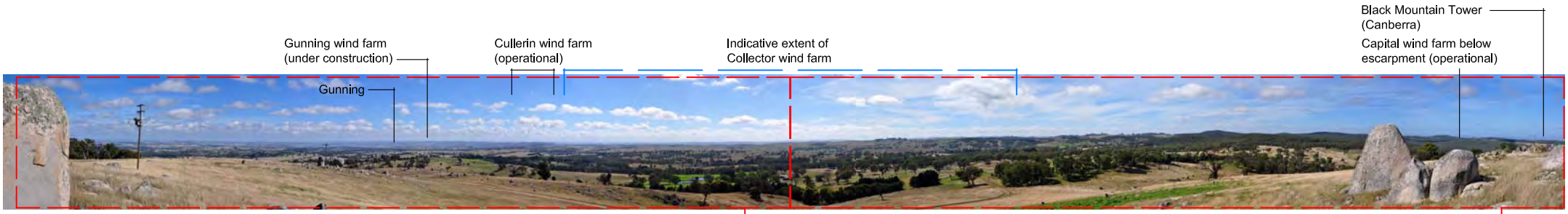

Photo Location CO1 - Existing regional view north west to south from The Towers

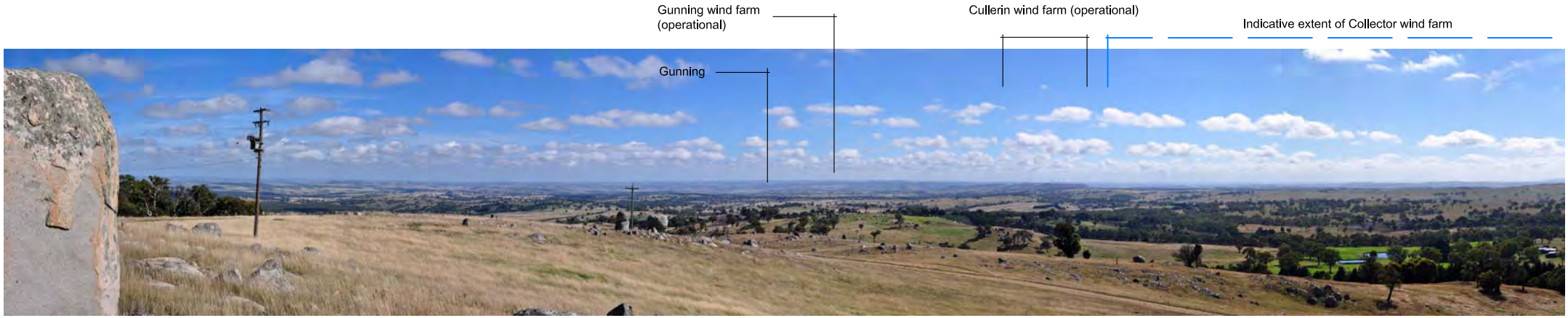

Photo Location CO1 - Detail A, Existing view

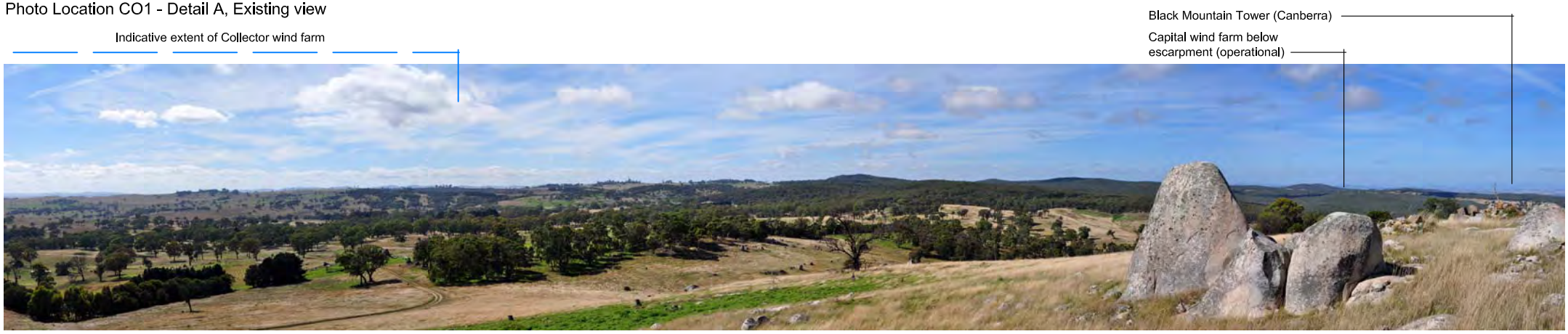

Photo Location CO1 - Detail B, Existing view

Figure 9 Photo Sheet 1

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COLLECTOR WIND FARM

Extent of wind farm visibility illustrated on the panoramic photographs is indicative only. The photo sheets do not illustrate the proposed Collector wind turbine locations.

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Photo Location CO2 - View north to east from Lerida Road South

Photo Location C03 - View north to east from Lerida Road South

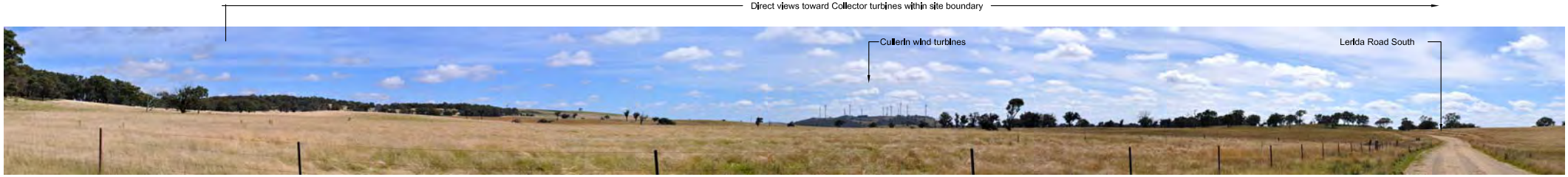

Photo Location CO4 - View north to north east from Lerida Road South

Photo Location CO5 - View north to south east from Hume Highway

Figure 10 Photo Sheet 2

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COLLECTOR WIND FARM

Extent of wind farm visibility illustrated on the panoramic photographs is indicative only. The photo sheets do not illustrate the proposed Collector wind turbine locations.

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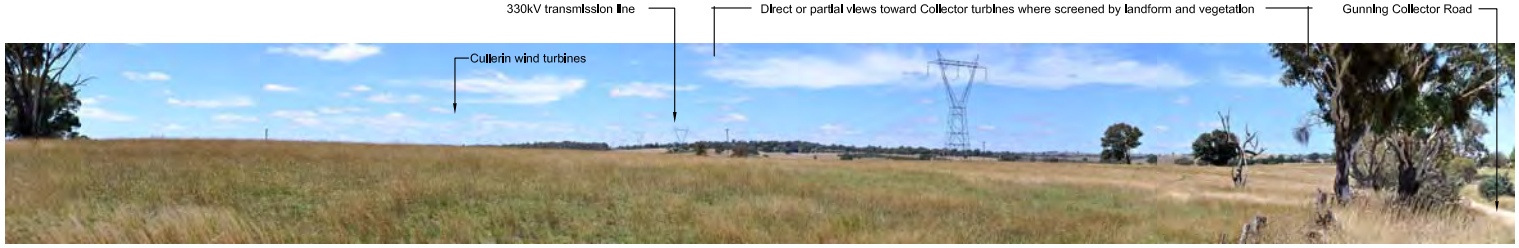

Photo Location CO6 - View east to south east from the Gunning Collector Road

Photo Location C07 - View north to east from the Gunning Collector Road

Photo Location CO8 - View north to east from the Gunning Collector Road

Photo Location CO9 - View north west to east from the Gunning Collector Road

Figure 11 Photo Sheet 3

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COLLECTOR WIND FARM

Extent of wind farm visibility illustrated on panoramic photographs is indicative only. The Photo Sheets do not illustrate the proposed Collector wind turbines.

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Photo Location CO10 - View west to east from the Gunning Collector Road

Photo Location C011 - View south to north from the Gunning Collector Road

Photo Location CO12 - View south to west from Currawang Road

Photo Location CO13 - View west to north east from the Federal Highway

Figure 12 Photo Sheet 4

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COLLECTOR WIND FARM

Extent of wind farm visibility illustrated on panoramic photographs is indicative only. The Photo Sheets do not illustrate the proposed Collector wind turbines.

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Photo Location CO14 - View west to east from Goulburn Street cul-de-sac, Collector

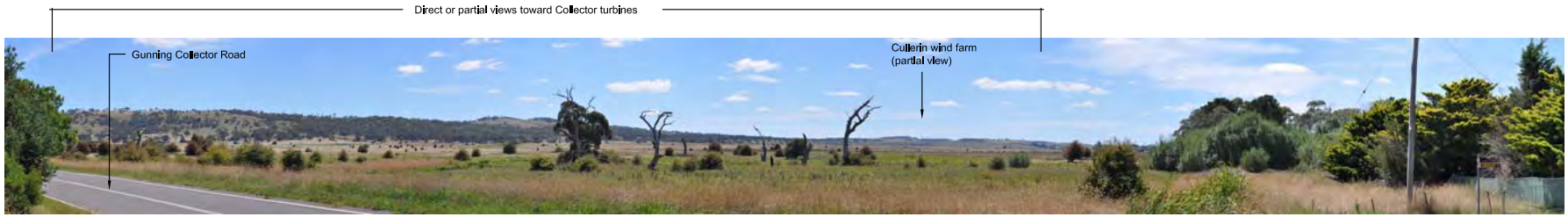

Photo Location C015 - View west to north from Church Street (west), Collector

Photo Location CO16 - View south to west from Collector Road

Photo Location CO17 - View south to north east from Collector Road

Figure 13 Photo Sheet 5

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COLLECTOR WIND FARM

Extent of wind farm visibility illustrated on the panoramic photographs is indicative only. The photo sheets do not illustrate the proposed Collector wind turbine locations.

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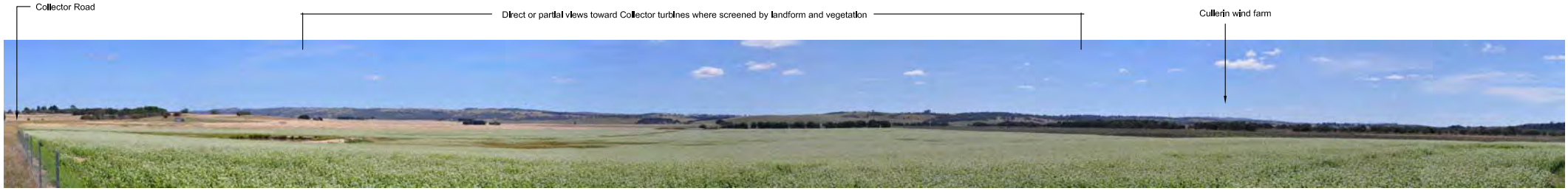

Photo Location CO18 - View south to north from Collector Road

Photo Location C019 - View south to north west from Collector Road

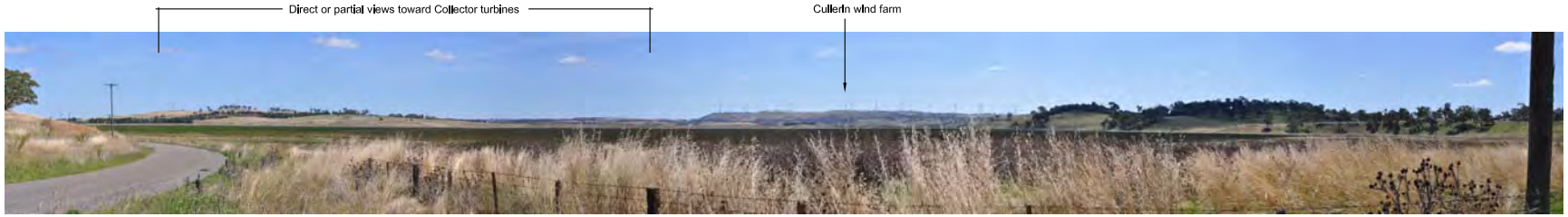

Photo Location CO20 - View south to west from Collector Road

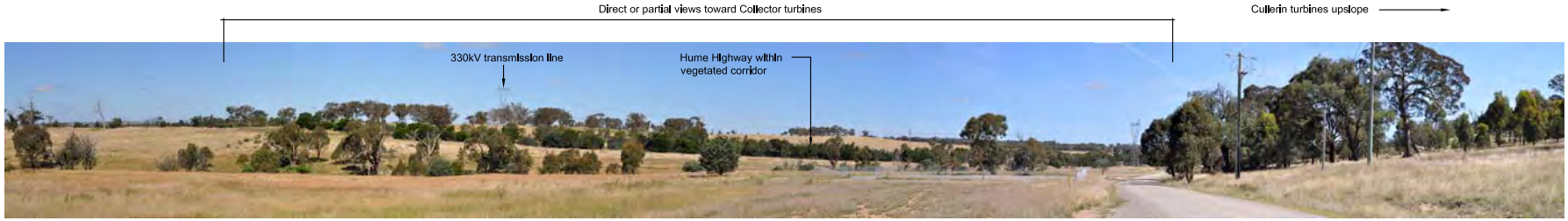

Photo Location CO21 - View south east to west from the Cullerin wind farm access road

Figure 14 Photo Sheet 6

RATCH-Australia Corporation

COLLECTOR WIND FARM

Extent of wind farm visibility illustrated on the panoramic photographs is indicative only. The photo sheets do not illustrate the proposed Collector wind turbine locations.

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