

LIVERPOOL RANGE WIND FARM

Addendum Report

Prepared for:

EPURON PTY LTD

Prepared by:

GREEN BEAN DESIGN
landscape architects

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DOUCMENT CONTROL

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Green Bean Design – Capability statement

Green Bean Design (GBD) was established as a landscape architectural consultancy in 1999 and has specialised in landscape and visual impact assessment over the past 10 years. As an independent consultancy, GBD provide professional advice to a wide range of commercial and government clients involved in large infrastructure project development.

GBD owner, and principal landscape architect Andrew Homewood, is a registered landscape architect and member of the Australian Institute of Landscape Architects and the Environmental Institute of Australia and New Zealand. Andrew has over 22 years continuous employment in landscape consultancy and has completed numerous landscape and visual impact assessments for a variety of large scale and state significant infrastructure, including mines, transmission lines/substations, wind farms and solar power developments.

Introduction

This response to submission has been prepared further to submissions from the public, organisations and government agencies, including comments provided by the NSW Department of Planning and Environment in July 2016.

This Addendum Report addresses the concerns and provides further details on potential visual impacts identified in the Liverpool Range Wind Farm Landscape and Visual Impact Assessment March 2014.

The NSW Department of Planning and Environment response noted that:

'a photomontage or justification as to why a photomontage is not required (e.g. further consultation and/or assessment has occurred) may be required to address any gaps in the original assessment identified in submissions'.

The Addendum Report has adopted wireframe models, rather than photomontage, to illustrate the location and number of wind turbines which may be visible from dwelling locations. For the purpose of this Addendum Report wireframes are considered preferential to photomontages as they:

- Allow a wider view angle to be presented without loss of clarity
- Clearly identify wind turbines screened by landform alone therefore representing a very conservative outcome
- Illustrate distant wind turbines (in excess of 5 kilometres) which may not be readily visible in a photomontage.

The preparation of wireframe diagrams is also supported by the Scottish Natural Heritage Guidelines 'Visual Representation of Wind Farms' version 2.1 December 2014. The Scottish Guidelines note that wireframes are:

'computer generated line drawings, based on a Digital Terrain Model, that indicate the three-dimensional shape of the landscape in combination with additional elements. They are a valuable tool in the wind farm LVIA process as they allow the assessor to compare the position and scale of the turbines to the existing landscape'.

The Scottish Guidelines also note that wireframes are:

'particularly useful to the landscape architect or experienced specialist assessor as they portray objective data. This means that, by comparing wireframes with views on the site, the assessor can make judgements on the likely visual impacts in a variety of environmental conditions, safe in the knowledge that the wireframes have not been subject to manipulation that cannot be quantified. They can also reveal what would be visible if an existing screening element, for example vegetation or building, were removed'.

The preparation of this Addendum Report included the following key tasks:

- Site inspections
- Meetings and discussions with residents
- Preparation of wireframes
- Detailed desk top assessment
- Preparation of additional figures.

Wind Energy: Visual Assessment Bulletin

The Wind Energy: Visual Assessment Bulletin (December 2016) has been developed by NSW Department of Planning and Environment to establish a framework for the assessment of visual impacts associated with wind energy. This Addendum Report notes that the Wind Energy: Visual Assessment Bulletin is not applicable to the Liverpool Range Wind Farm Landscape and Visual Impact Assessment (March 2014) or to this Addendum Report as the Secretary's Environmental Assessment Requirements (SEARs), (formerly Director-Generals Requirements), were issued prior to the date of the Bulletin.

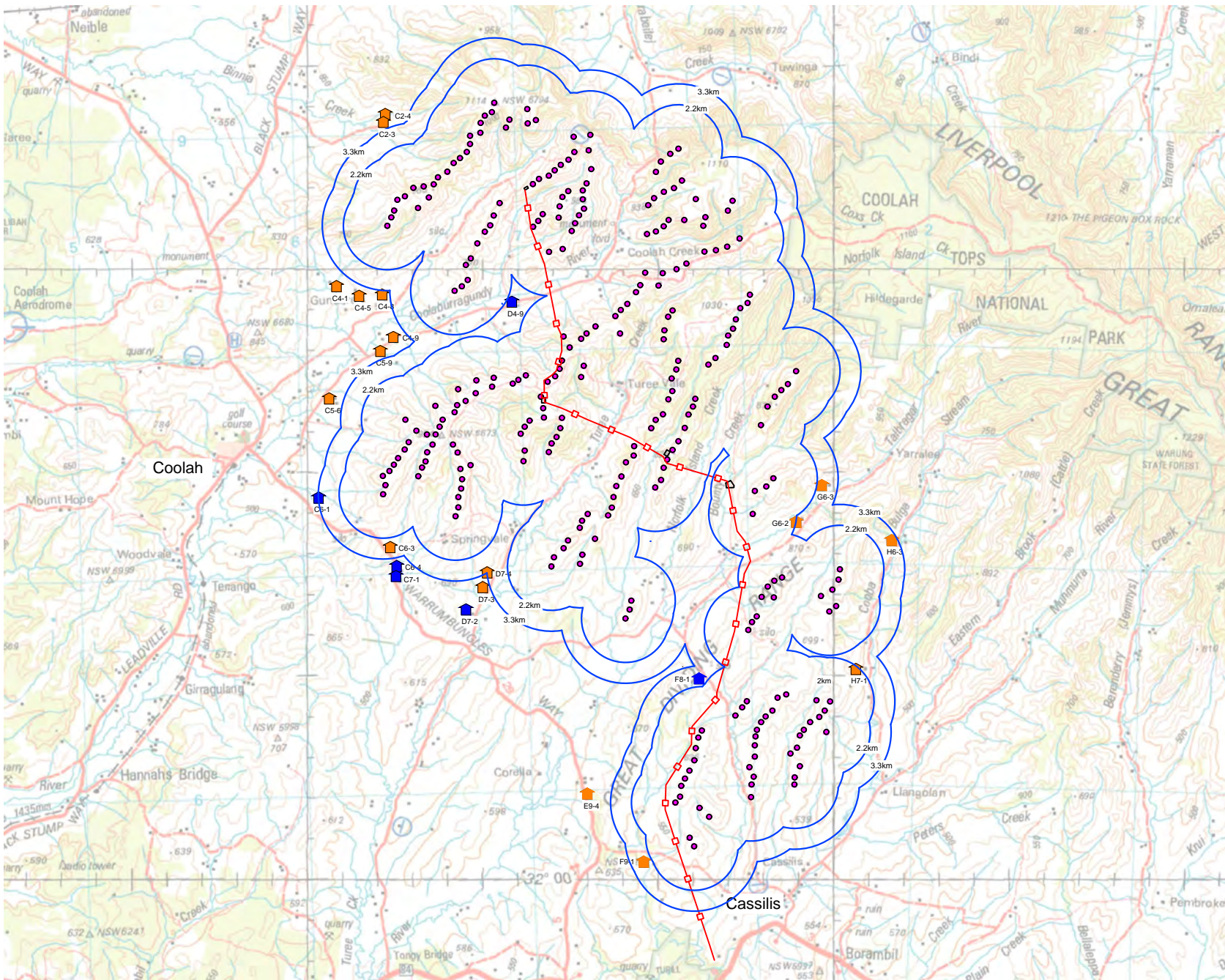
Whilst the Wind Energy: Visual Assessment Bulletin does not apply to the Liverpool Range Wind Farm application; this Addendum Report has considered and included some of the visual performance objectives outlined in the Bulletin. Specifically, these include visual magnitude and multiple wind turbine effects.

The visual magnitude threshold lines (Bulletin **Figure 5**) for the proposed Liverpool Range 165 metre tip of blade wind turbine have been determined at 2,200 metres (black line) and 3,300 metres (blue line). These thresholds have been illustrated from the wind turbines toward residential dwellings (**Figure 1**) as well as from individual residential dwellings and public view locations toward wind turbines (**Figures 2 to 20**). The thresholds are not determinative of visual impact and have been illustrated to provide a basis for the additional visual assessment.

The Bulletin also includes guidance on the assessment of visual impacts associated with multiple wind turbines. The performance objectives, including views toward wind turbines within 60 degree sectors has been considered in the additional visual assessment and illustrated in the figures accompanying this Addendum Report.

Site inspection and consultation

The Addendum Report has incorporated the results of further site inspections and meetings with involved and uninvolved property owners within and surrounding the wind farm site boundary. **Table 1** outlines the results of site inspections carried out in November 2016, and discussions with residents surrounding the proposed Liverpool Range Wind Farm. The dwelling locations included in **Table 1** are illustrated on **Figure 1**.



Legend

- Proposed Liverpool Range wind turbine (indicative location)
- Involved dwelling
- Uninvolved dwelling
- () Distance from proposed Liverpool Range wind turbine
- Proposed 330 kV powerline route within wind farm project area

Figure 1
Residential dwelling locations

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Table 1 – Site inspection and consultation record

Dwelling ID	Name	Involved or uninvolved	Site inspection	Comments
C2-3 and C2-4	Binnia Hills	Uninvolved	10/11/2016	Two dwellings on property. C2-3 veranda oriented North-West and heavily screened to the south in direction of turbine locations. Photo taken from paddock between house and shed. C2-4 is situated in a valley and completely screened from the project. Additional assessment undertaken
C4-1	Winooka	Uninvolved	10/11/2016	Additional assessment undertaken
C4-5	Gundare	Uninvolved	10/11/2016	Photo taken from front of house. House situated quite high up. Visual impact not a big concern. Additional assessment undertaken
C4-8		Uninvolved	9/11/2016	No tree screening exists. Photo taken from front yard. The veranda is orientated to the south east. There is no permanent resident, however the dwelling is used frequently. Additional assessment undertaken
C4-9	Leeton	Uninvolved	10/11/2016	No one living there. House dilapidated. Some screening around house. Photo taken from back of house near the shed. Additional assessment undertaken

Table 1 – Site inspection and consultation record

Dwelling ID	Name	Involved or uninvolved	Site inspection	Comments
C5-6	Kurrallah	Uninvolved	10/11/2016	Photo taken from side of house. House currently not inhabited but intending to rent out in the future. Additional assessment undertaken
C5-9	Willania	Uninvolved	9/11/2016	House quite well screened. Photo taken from edge of back yard. No real concern over visual impact. Additional assessment undertaken
C6-1	Sunnyside	Involved		No additional assessment undertaken
C6-3	Collie Blue	Uninvolved	11/03/2016	Additional assessment undertaken
C6-4	Brooksby	Involved		No additional assessment undertaken
C7-1	Wilandra	Involved		No additional assessment undertaken
D4-9	Gynawah	Involved	9/11/2016	Involved landowner with construction compound and then neighbour agreement. Photo taken from front/back of house. Additional assessment undertaken
D7-2		Involved		No additional assessment undertaken
D7-3	Tallue		9/11/2016	Visited, house fully screened. A photomontage was offered but agreed

Table 1 – Site inspection and consultation record

Dwelling ID	Name	Involved or uninvolved	Site inspection	Comments
				as not necessary due to screening extent. No additional assessment undertaken
D7-4	Cooinda	Uninvolved		Additional assessment undertaken
E9-4	Rangeview	Uninvolved	9/11/2016	Photos taken from water tank. E9-4 being rented out. Owners had no concerns.
F8-1	Tangaratta	Involved		Property has been sold to involved landowner. No additional assessment undertaken
F9-1	Culbara	Uninvolved		Additional assessment undertaken
G6-2	Glenwood	Uninvolved		Additional assessment undertaken
G6-3	Ellaroy	Uninvolved		Additional assessment undertaken
H6-3		Uninvolved	10/11/2016	No concerns, didn't feel the need for photos to be taken. Would see a very small number of turbines at most. No additional assessment undertaken
H7-1	St Antoine	Uninvolved	10/11/2016	Additional assessment undertaken

Additional visual assessment

This Addendum Report has undertaken additional visual assessment of dwellings identified in the NSW Department of Planning and Environment response to submission. This has incorporated the results of additional site work and further detailed desk top assessment including the provision of wire frame models.

Uninvolved dwellings C2-3 and C2-4 (Binnia Hills)

LVIA V3 March 2014

The LVIA V3 March 2014 included an assessment of dwellings C2-3 and C2-4 within view location L5 located around 4.8 kilometres to the east of the Mullaley Coolah Road. The LVIA V3 March 2014 noted that *'Views from residential properties will be largely restricted to wind turbines elevated along the northern edge of the project area'*. The LVIA V3 March 2014 determined that dwellings within view location L5 would be subject to a medium level of visual effect.

Further visual assessment:

A further assessment for dwelling C2-4 has determined that the dwelling is located on the lower portion of a north facing slope. The sloping landform extending above the dwelling is likely to screen views from the dwelling and surrounding garden toward the proposed wind turbines. The C2-3 wireframe model (Figure 2) illustrates that around 18 wind turbines would be visible from hub height (and below). Visibility from the C2-3 dwelling would be partially restricted by a row of mature trees around 35 metres to the east of the dwelling. The wireframe model also indicates that wind turbines would be visible within two 60° sectors.

Further visual assessment has determined that dwelling C2-4 is unlikely to be directly impacted by the wind farm and that dwelling C2-3 would be subject to a **low to medium visual effect**.

Wireframe:

Figure 2, C2-3 wireframe information:

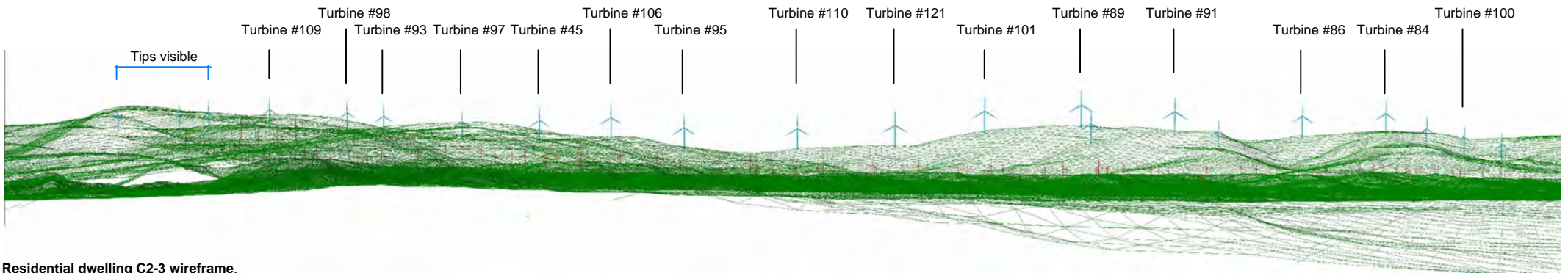
Wireframe start bearing: 75°, Wireframe end bearing: 186°

Tips visible: 22

Hubs visible: 18

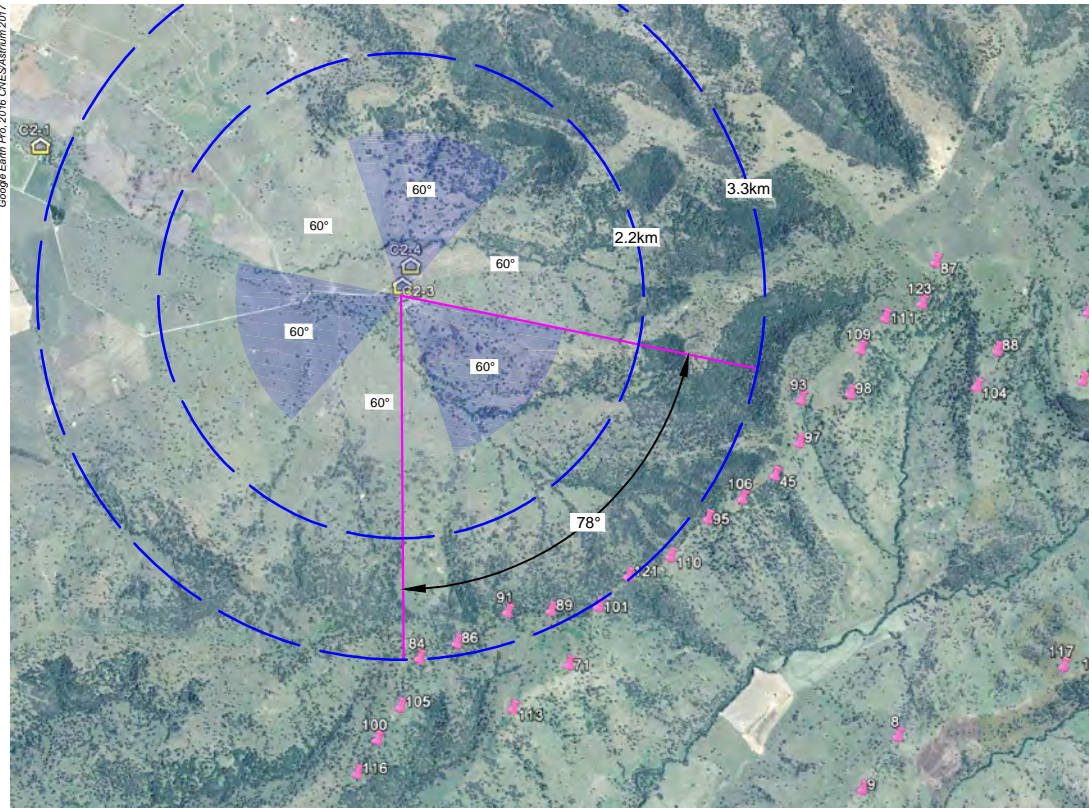
Closest turbine: Turbine #91 - 3,265m

Note: The number of visible wind turbine tips and hubs depicted in the wireframe model does not take into account the location and potential screening influence of existing tree cover, including planting proximate to, or beyond, residential dwellings.

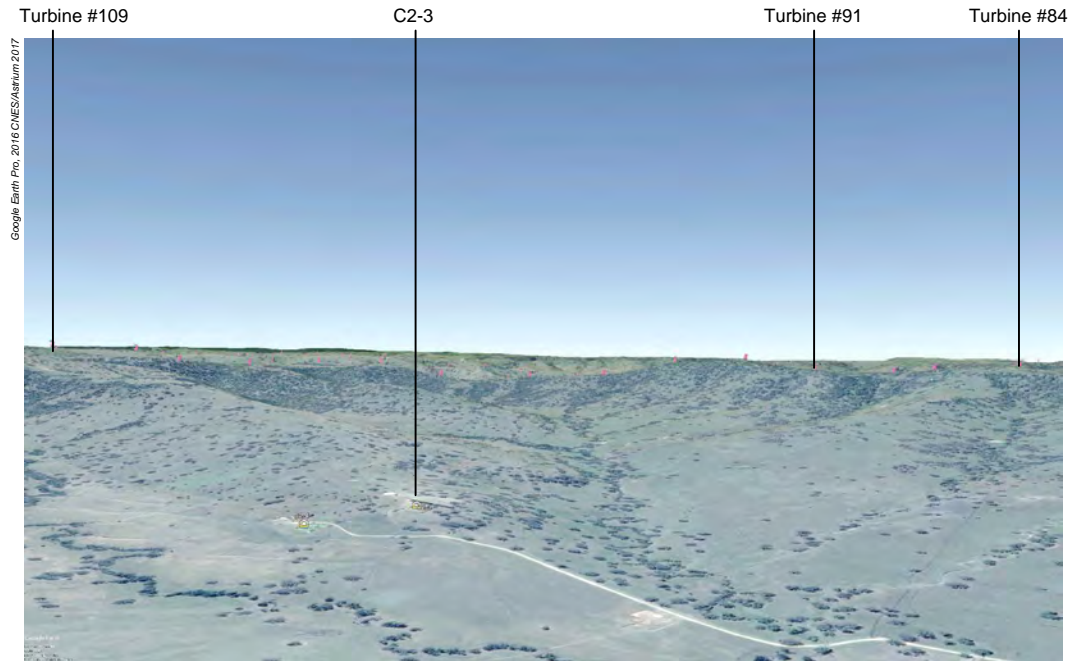
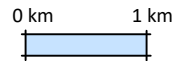


Residential dwelling C2-3 wireframe.

Approximate 78 degree field of view south east from residential dwelling C2-3. Distance to closest wind turbine (#91) 3,265 metres. Visibility does not account for existing tree cover between dwelling and wind turbine, including existing tree planting within proximity to the residential dwelling. Blue wind turbines are visible or partially visible to tip of blade. Red wind turbines are screened by landform.



Residential dwelling C2-3 location plan



Residential dwelling C2-3 aerial oblique.

The aerial oblique illustrates typical landform characteristics and location of existing tree cover between C2-3 and surrounding wind turbines. The extent of wind turbines illustrated in the aerial oblique does not represent the potential visibility of wind turbines from the dwelling.

Note:

The landform illustrated in the green wireframe model occurs between the residential dwelling and the wind turbines. Sections of blue wind turbines will not be visible where indicated within or below the green wireframe model. Views will only extend toward sections of blue wind turbines where they occur above the green wireframe model.

Figure 2 Dwelling C2-3 Wireframe analysis

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Uninvolved dwelling C4-1 (Winooka)

LVIA V3 March 2014

The LVIA V3 March 2014 included an assessment of dwelling C4-1 within view location L4 located to the west of the Gundare Road. The LVIA V3 March 2014 noted that *'Views extent along and across valleys toward wind turbines located on hilltop and ridgeline areas. Some residential dwellings will have partial screening through tree planting surrounding dwellings'*. The LVIA V3 March 2014 determined that dwellings within view location L4 would be subject to a medium level of visual effect.

Further visual assessment:

A supplementary assessment for dwelling C4-1 has determined that the dwelling is located on gently sloping land above a drainage line. This location affords medium to long distance views to surrounding ridgeline locations. The C4-1 wireframe model (Figure 3) illustrates that around 54 wind turbines would be visible from hub height (and below). Visibility from the C4-1 dwelling is generally open, however scattered tree planting surrounding the dwelling will provide some degree of visual filtering toward the wind turbines. The wireframe model also indicates that wind turbines would be visible up to a distance of around 6 kilometres within one 60° sector.

Further visual assessment has determined that dwelling C4-1 is unlikely to be significantly impacted by the wind farm and that dwelling C4-1 would be subject to a **medium visual effect** in accordance with the LVIA V3 March 2014 determination.

Wireframe:

Figure 3, C4-1 wireframe information:

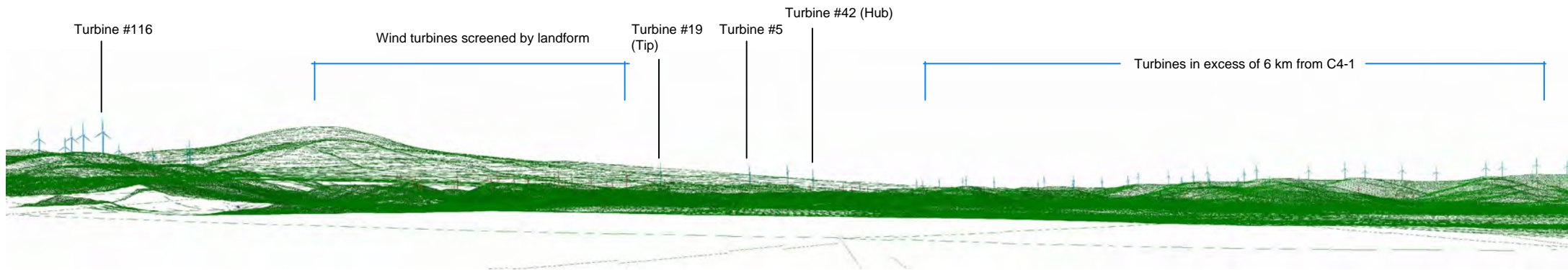
Start bearing: 30°, End bearing: 170°

Tips visible: 72

Hubs visible: 54

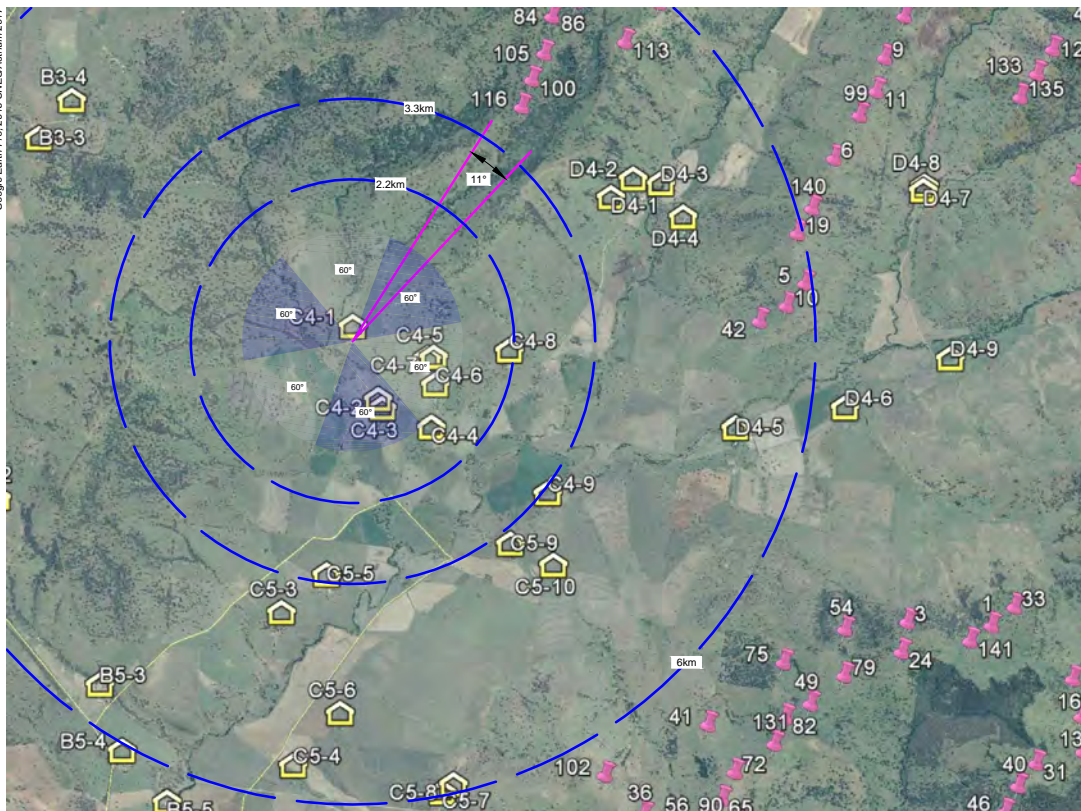
Closest turbine: Turbine #116 - 3,631m

Note: The number of visible wind turbine tips and hubs depicted in the wireframe model does not take into account the location and potential screening influence of existing tree cover, including planting proximate to, or beyond, residential dwellings.

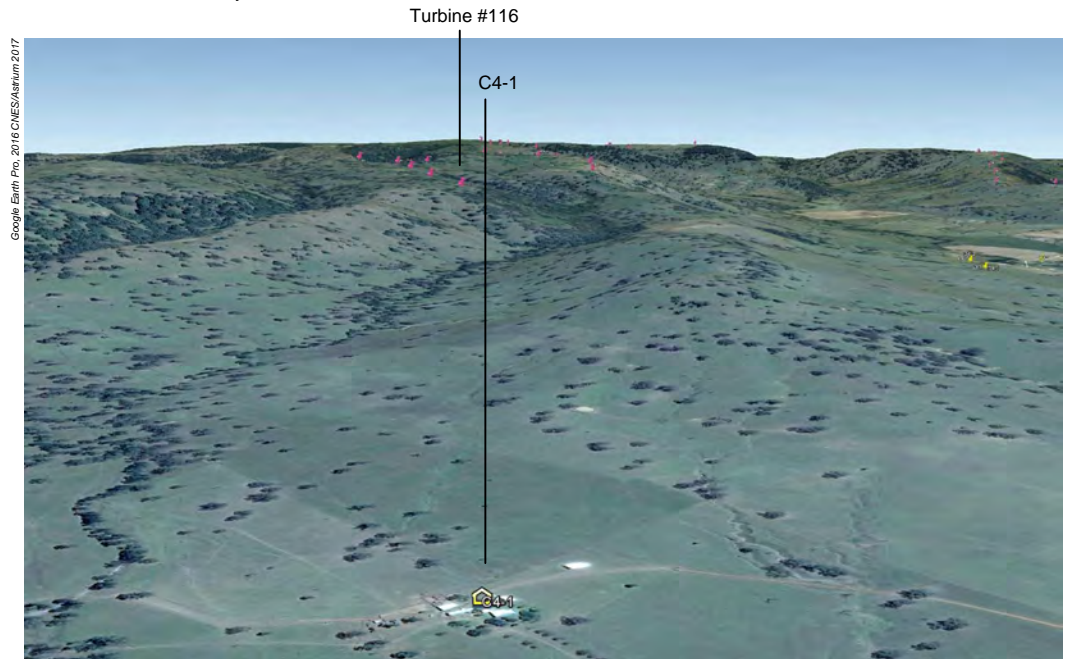
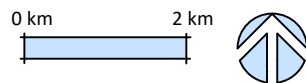


Residential dwelling C4-1 wireframe.

Approximate 11 degree field of view north east from residential dwelling C4-1. Distance to closest wind turbine (#116) 3,631 metres. Visibility does not account for existing tree cover between dwelling and wind turbine, including existing tree planting within proximity to the residential dwelling. Blue wind turbines are visible or partially visible to tip of blade. Red wind turbines are screened by landform.



Residential dwelling C4-1 location plan



Residential dwelling C4-1 aerial oblique.

The aerial oblique illustrates typical landform characteristics and location of existing tree cover between C4-1 and surrounding wind turbines. The extent of wind turbines illustrated in the aerial oblique does not represent the potential visibility of wind turbines from the dwelling.

Note:

The landform illustrated in the green wireframe model occurs between the residential dwelling and the wind turbines. Sections of blue wind turbines will not be visible where indicated within or below the green wireframe model. Views will only extend toward sections of blue wind turbines where they occur above the green wireframe model.

Figure 3 Dwelling C4-1 Wireframe analysis

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Uninvolved dwelling C4-5 (Gundare)

LVIA V3 March 2014

The LVIA V3 March 2014 included an assessment of dwelling C4-5 within view location L4 located to the west of the Gundare Road. The LVIA V3 March 2014 noted that *'Views extent along and across valleys toward wind turbines located on hilltop and ridgeline areas. Some residential dwellings will have partial screening through tree planting surrounding dwellings'*. The LVIA V3 March 2014 determined that dwellings within view location L4 would be subject to a medium level of visual effect.

Further visual assessment:

A supplementary assessment for dwelling C4-5 has determined that the dwelling is located on top of a low undulation within the broader valley floor. This location affords medium to long distance views to surrounding ridgeline locations. The C4-5 wireframe model (Figure 4) illustrates that around 93 wind turbines would be visible from hub height (and below). Visibility from the C4-5 dwelling is generally open; however, the owners have indicated no particular concerns with regard to the potential for visual effects. The wireframe model also indicates that wind turbines would be visible up to a distance of around 6 kilometres within two 60° sectors.

Further visual assessment has determined that dwelling C4-5 is unlikely to be significantly impacted by the wind farm and that dwelling C4-5 would be subject to a **medium visual effect** in accordance with the LVIA V3 March 2014 determination.

Wireframe:

Figure 4, C4-5 wireframe information:

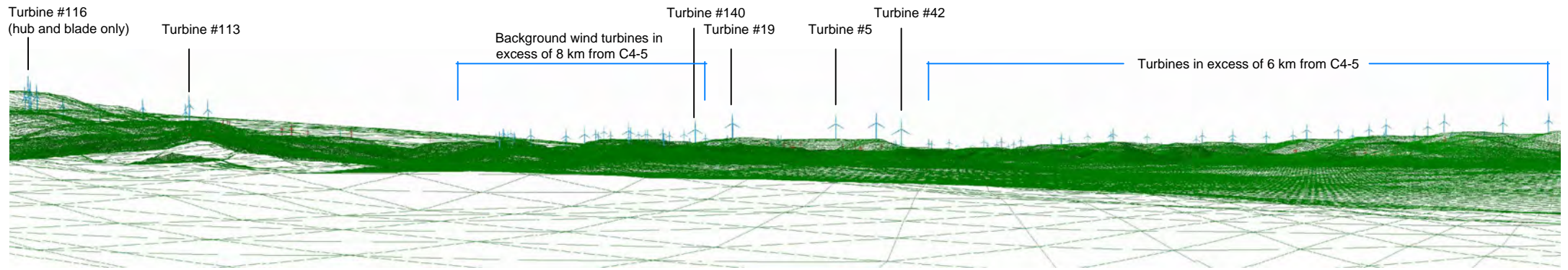
Start bearing: 20°, End bearing: 173°

Tips visible: 128

Hubs visible: 93

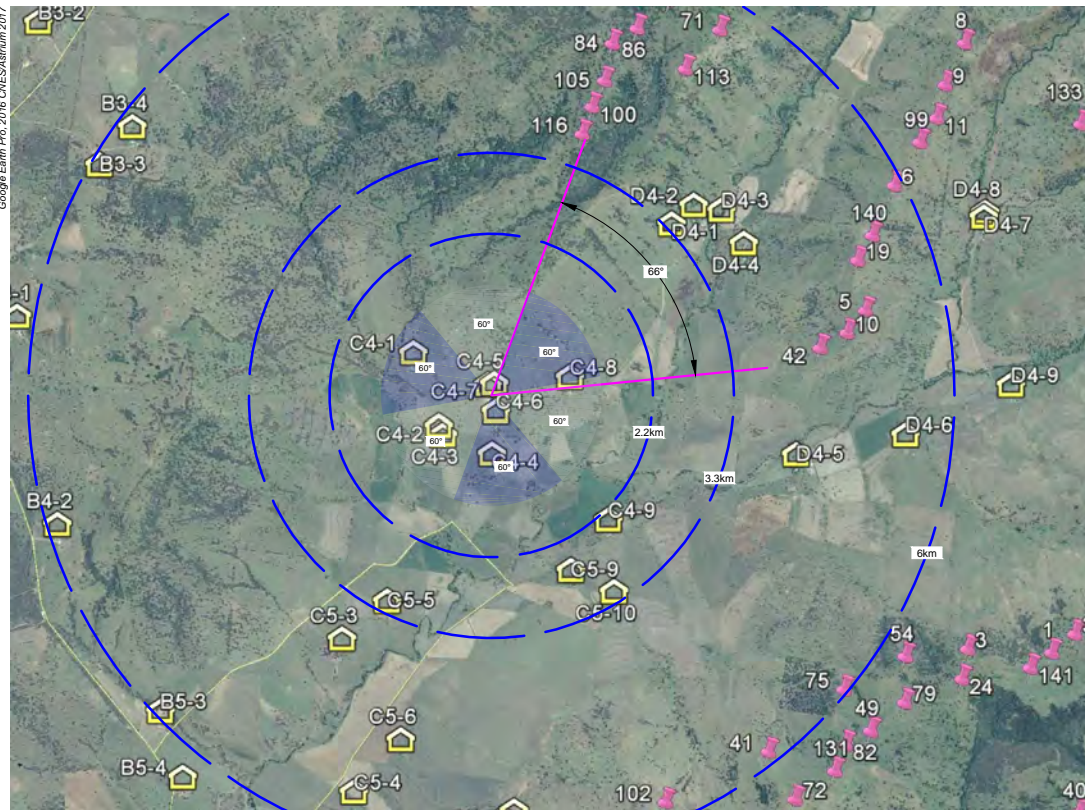
Closest turbine: Turbine #116 - 3,500m

Note: The number of visible wind turbine tips and hubs depicted in the wireframe model does not take into account the location and potential screening influence of existing tree cover, including planting proximate to, or beyond, residential dwellings.

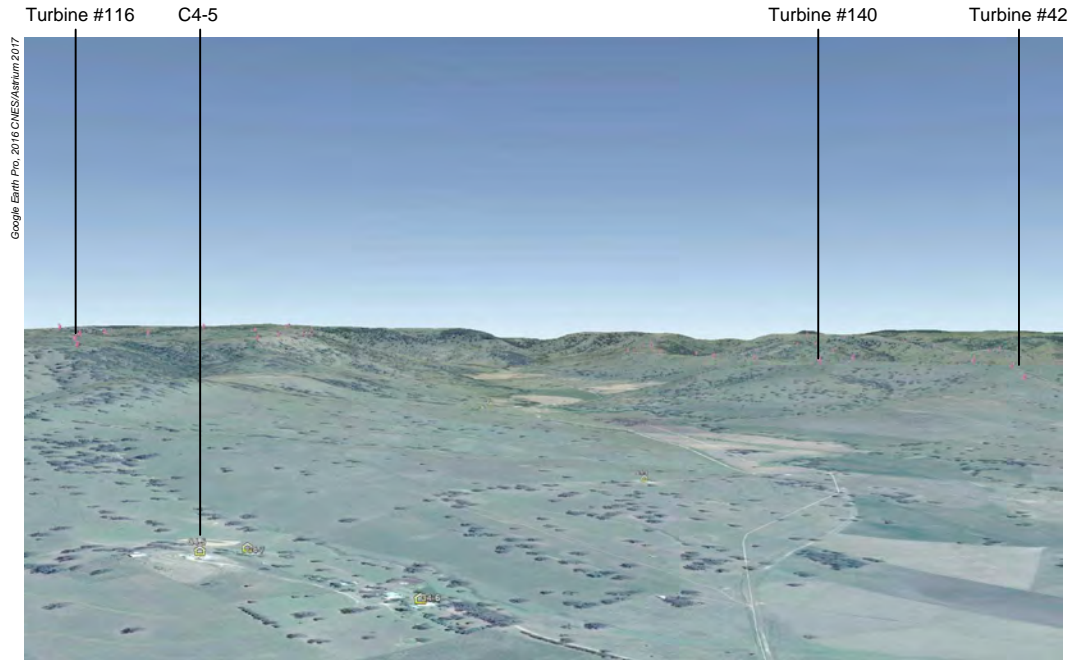
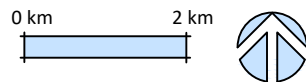


Residential dwelling C4-5 wireframe.

Approximate 66 degree field of view north east from residential dwelling C4-5. Distance to closest wind turbine (#116) 3,500 metres. Visibility does not account for existing tree cover between dwelling and wind turbine, including existing tree planting within proximity to the residential dwelling. Blue wind turbines are visible or partially visible to tip of blade. Red wind turbines are screened by landform.



Residential dwelling C4-5 location plan



Residential dwelling C4-5 aerial oblique.

The aerial oblique illustrates typical landform characteristics and location of existing tree cover between C4-5 and surrounding wind turbines. The extent of wind turbines illustrated in the aerial oblique does not represent the potential visibility of wind turbines from the dwelling.

Note:

The landform illustrated in the green wireframe model occurs between the residential dwelling and the wind turbines. Sections of blue wind turbines will not be visible where indicated within or below the green wireframe model. Views will only extend toward sections of blue wind turbines where they occur above the green wireframe model.

Figure 4 Dwelling C4-5 Wireframe analysis

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Uninvolved dwelling C4-8

LVIA V3 March 2014

The LVIA V3 March 2014 included an assessment of dwelling C4-8 within view location L4 located to the west of the Gundare Road. The LVIA V3 March 2014 noted that *'Views extent along and across valleys toward wind turbines located on hilltop and ridgeline areas. Some residential dwellings will have partial screening through tree planting surrounding dwellings'*. The LVIA V3 March 2014 determined that dwellings within view location L4 would be subject to a medium level of visual effect.

Further visual assessment:

A supplementary assessment for dwelling C4-8 notes that the dwelling is located on a sloping hillside above the adjoining valley floor. This location affords medium to long distance views to surrounding ridgeline locations. The C4-8 wireframe analysis (Figure 5) illustrates that around 113 wind turbines would be visible from hub height (and below). Visibility from the C4-8 dwelling is generally open with views extending from the closest wind turbine at 3,200 metres to more distant groupings at 5.5 kilometres and 7.5 kilometres. The wireframe model also indicates that wind turbines would be visible up to a distance around 5.5 kilometres within two 60° sectors.

Further visual assessment has determined that dwelling C4-8 is likely to be impacted by the wind farm and that dwelling C4-8 would be subject to a **medium to high visual effect**.

Wireframe:

Figure 5, C4-8 wireframe information:

Start bearing: 1°, End bearing: 182°

Tips visible: 130

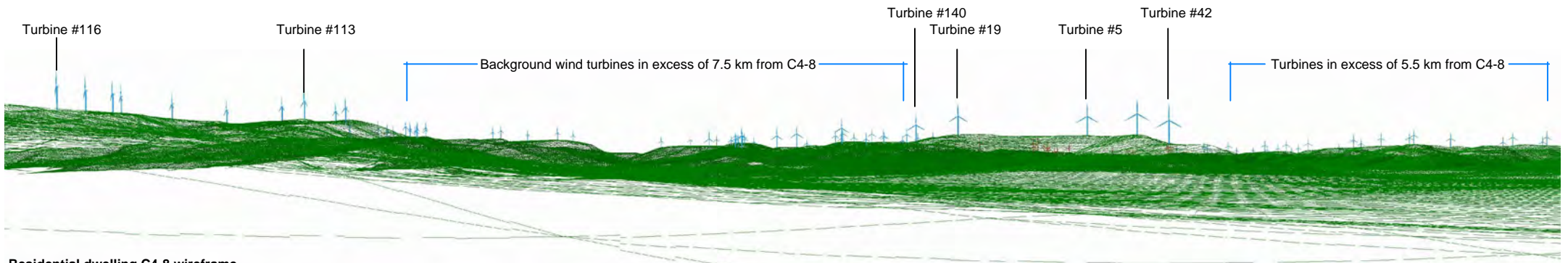
Hubs visible: 113

Closest turbine: Turbine #116 - 3,200m

Note: Note: The number of visible wind turbine tips and hubs depicted in the wireframe model does not take into account the location and potential screening influence of existing tree cover, including planting proximate to, or beyond, residential dwellings.

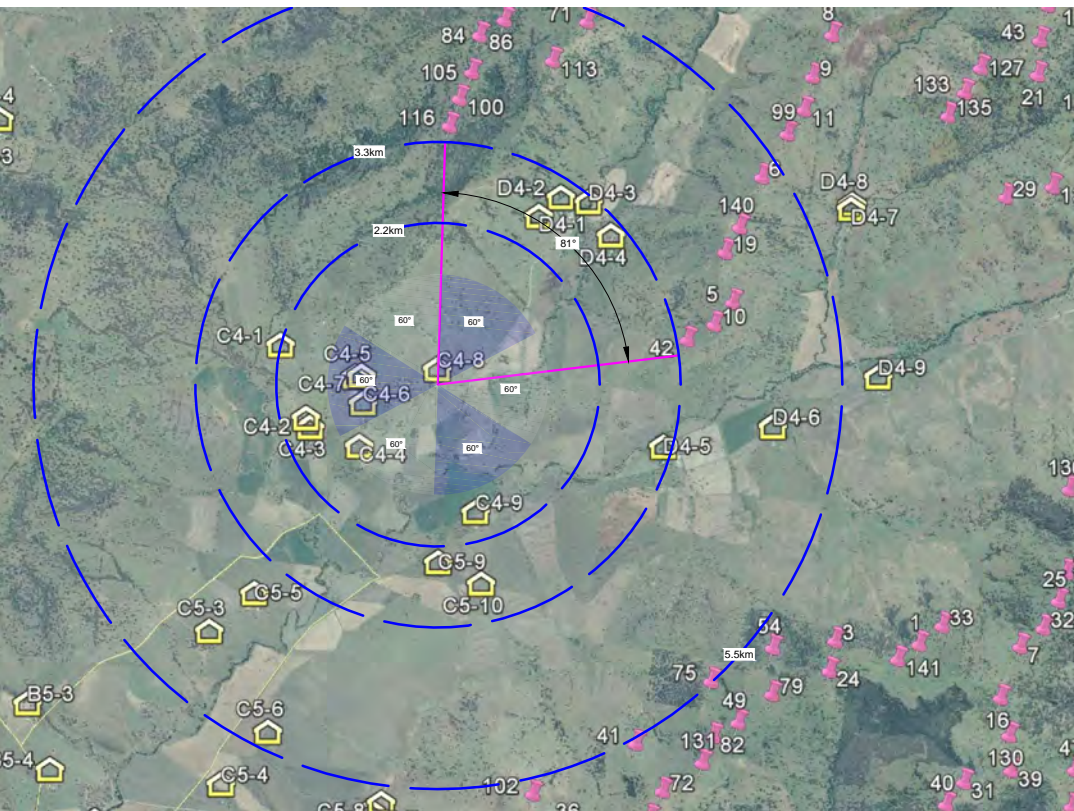
Potential for mitigation:

The potential visual effect of wind turbines is considered possible through appropriate landscape screening works. Any landscape mitigation would be required within proximity to the dwelling and its curtilage which would possibly result in the reduction and/or screening of existing medium and long distance views from the dwelling and its immediate surrounds.

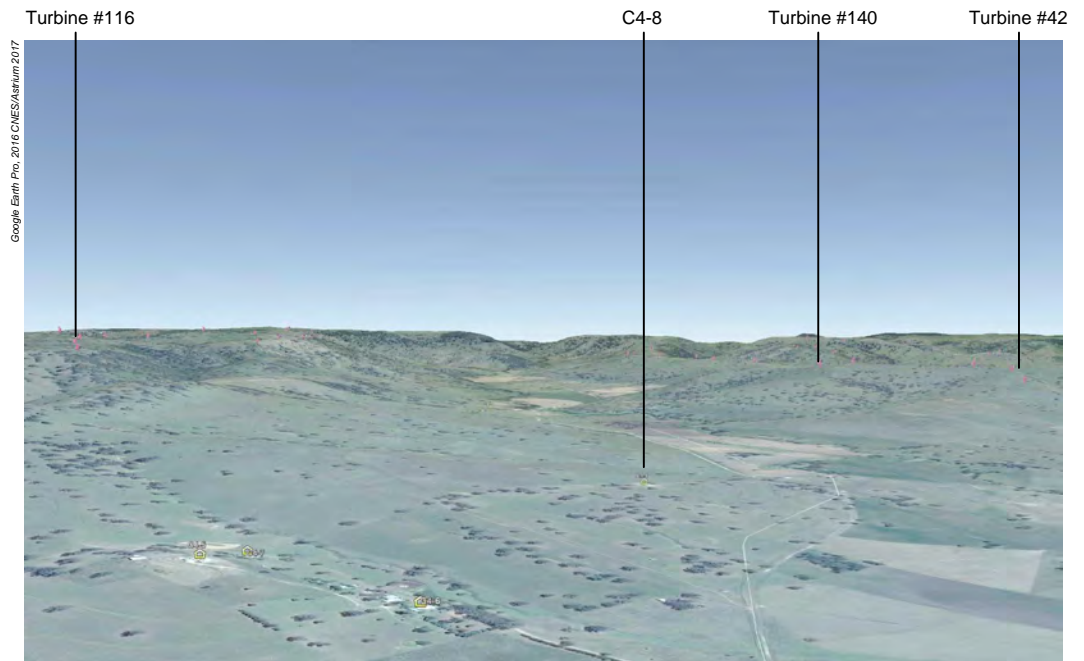
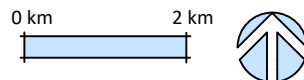


Residential dwelling C4-8 wireframe.

Approximate 81 degree field of view north east from residential dwelling C4-8. Distance to closest wind turbine (#116) 3,200 metres. Visibility does not account for existing tree cover between dwelling and wind turbine, including existing tree planting within proximity to the residential dwelling. Blue wind turbines are visible or partially visible to tip of blade. Red wind turbines are screened by landform.



Residential dwelling C4-8 location plan



Residential dwelling C4-8 aerial oblique.

The aerial oblique illustrates typical landform characteristics and location of existing tree cover between C4-8 and surrounding wind turbines. The extent of wind turbines illustrated in the aerial oblique does not represent the potential visibility of wind turbines from the dwelling.

Note:

The landform illustrated in the green wireframe model occurs between the residential dwelling and the wind turbines. Sections of blue wind turbines will not be visible where indicated within or below the green wireframe model. Views will only extend toward sections of blue wind turbines where they occur above the green wireframe model.

Figure 5 Dwelling C4-8 Wireframe analysis

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Uninvolved dwelling C4-9 (Leeton)

LVIA V3 March 2014

The LVIA V3 March 2014 included an assessment of dwelling C4-9 within view location L4 located to the south of Coolah Creek Road. The LVIA V3 March 2014 noted that *'Views extent along and across valleys toward wind turbines located on hilltop and ridgeline areas. Some residential dwellings will have partial screening through tree planting surrounding dwellings'*. The LVIA V3 March 2014 determined that dwellings within view location L4 would be subject to a medium level of visual effect.

Further visual assessment:

A supplementary assessment for dwelling C4-9 notes that the dwelling is located to the south of the Coolah Creek Road on relatively level land with a broad valley floor. This location affords medium to long distance views to surrounding ridgeline locations with some visual filtering provided by scattered mature tree cover surrounding the dwelling.

The C4-9 wireframe model (Figure 6) illustrates that around 115 wind turbines would be visible from hub height (and below). Visibility from the C4-9 dwelling is partially screened by tree cover with views extending from the closest wind turbine at around 3,582 metres to more distant groupings in excess of 4 kilometres and 8 kilometres. The wireframe model also indicates that wind turbines would be visible up to a distance around 4 kilometres within two 60° sectors.

Further visual assessment has determined that dwelling C4-9 is likely to be impacted by the wind farm and that dwelling C4-9 would be subject to a **medium visual effect** in accordance with the LVIA V3 March 2014.

Wireframe:

Figure 6, C4-9 wireframe information:

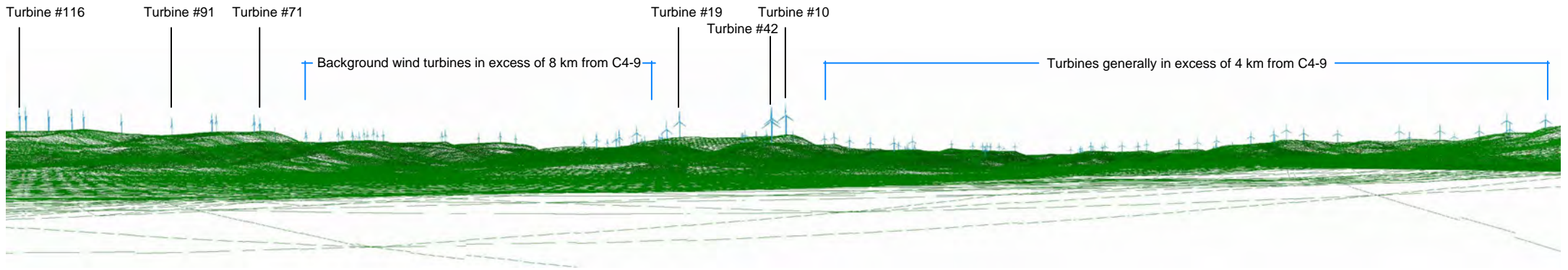
Start bearing: 357°, End bearing: 197°

Tips visible: 145

Hubs visible: 115

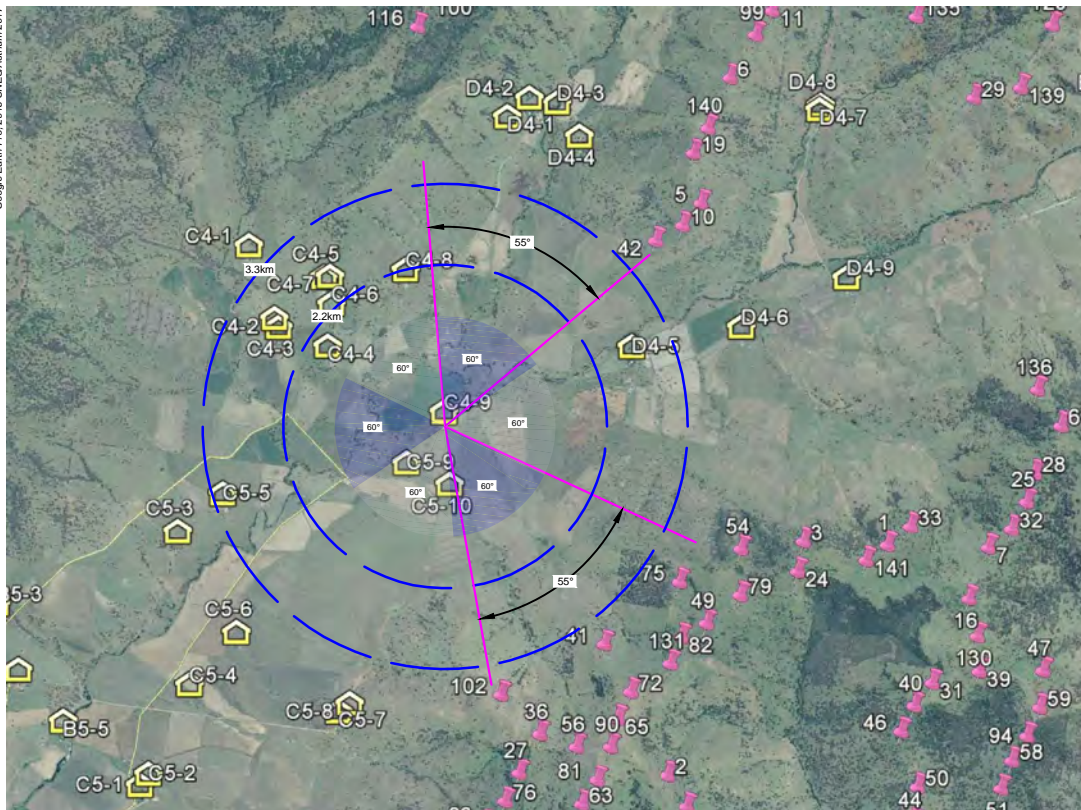
Closest turbine: Turbine #42 - 3,582m

Note: The number of visible wind turbine tips and hubs depicted in the wireframe model does not take into account the location and potential screening influence of existing tree cover, including planting proximate to, or beyond, residential dwellings.

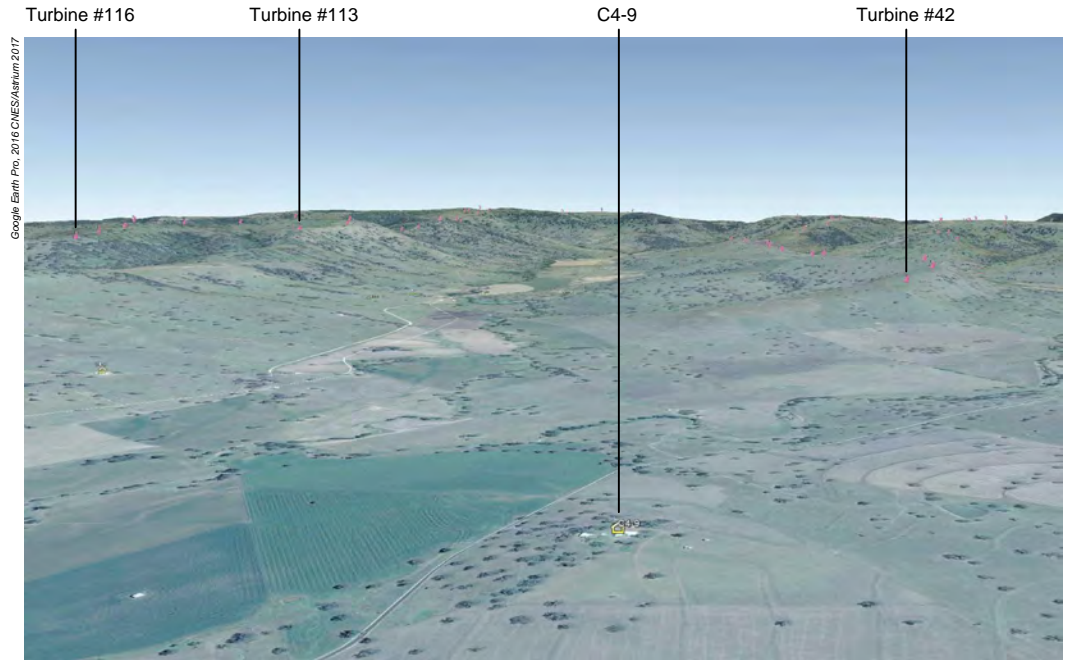


Residential dwelling C4-9 wireframe.

Approximate 55 degree field of view north east and south east from residential dwelling C4-9. Distance to closest wind turbine (#42) 3,582 metres. Visibility does not account for existing tree cover between dwelling and wind turbine, including existing tree planting within proximity to the residential dwelling. Blue wind turbines are visible or partially visible to tip of blade. Red wind turbines are screened by landform.



Residential dwelling C4-9 location plan



Residential dwelling C4-9 aerial oblique.

The aerial oblique illustrates typical landform characteristics and location of existing tree cover between C4-9 and surrounding wind turbines. The extent of wind turbines illustrated in the aerial oblique does not represent the potential visibility of wind turbines from the dwelling.

Note:

The landform illustrated in the green wireframe model occurs between the residential dwelling and the wind turbines. Sections of blue wind turbines will not be visible where indicated within or below the green wireframe model. Views will only extend toward sections of blue wind turbines where they occur above the green wireframe model.

Figure 6 Dwelling C4-9 Wireframe analysis

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Uninvolved dwelling C5-6 (Kurralah)

LVIA V3 March 2014

The LVIA V3 March 2014 included an assessment of dwelling C5-6 within view location L4 located to the south of Coolah Creek Road. The LVIA V3 March 2014 noted that *'Views extent along and across valleys toward wind turbines located on hilltop and ridgeline areas. Some residential dwellings will have partial screening through tree planting surrounding dwellings'*. The LVIA V3 March 2014 determined that dwellings within view location L4 would be subject to a medium level of visual effect.

Further visual assessment:

A supplementary assessment for dwelling C5-6 notes that the dwelling is located to the south of the Coolah Creek Road on relatively level to gently sloping land above the Coolah Creek line. This location affords opportunities for medium to long distance views to surrounding ridgeline locations. Some visual filtering is provided by scattered mature tree cover surrounding the dwelling.

The C5-6 wireframe model (Figure 7) illustrates that around 76 wind turbines would be visible from hub height (and below). Visibility from the C5-6 dwelling is partially screened by tree cover with views extending from the closest wind turbine at around 3,561 metres to more distant groupings including those in excess of 9 kilometres from dwelling C5-6. The wireframe model also indicates that wind turbines would be visible within one 60° sector.

Further visual assessment has determined that dwelling C5-6 is likely to be impacted by the wind farm and that dwelling C5-6 would be subject to **a medium visual effect** in accordance with the LVIA V3 March 2014.

Wireframe:

Figure 7, C5-6 wireframe information:

Start bearing: 0°, End bearing: 182°

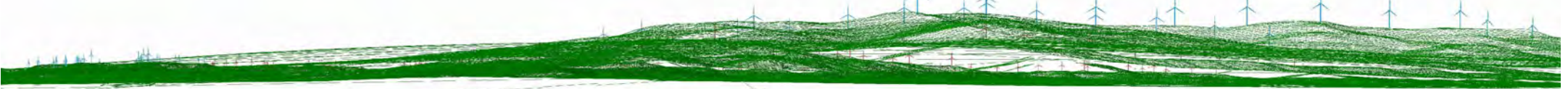
Tips visible: 141

Hubs visible: 113

Closest turbine: Turbine #102 - 3,561m

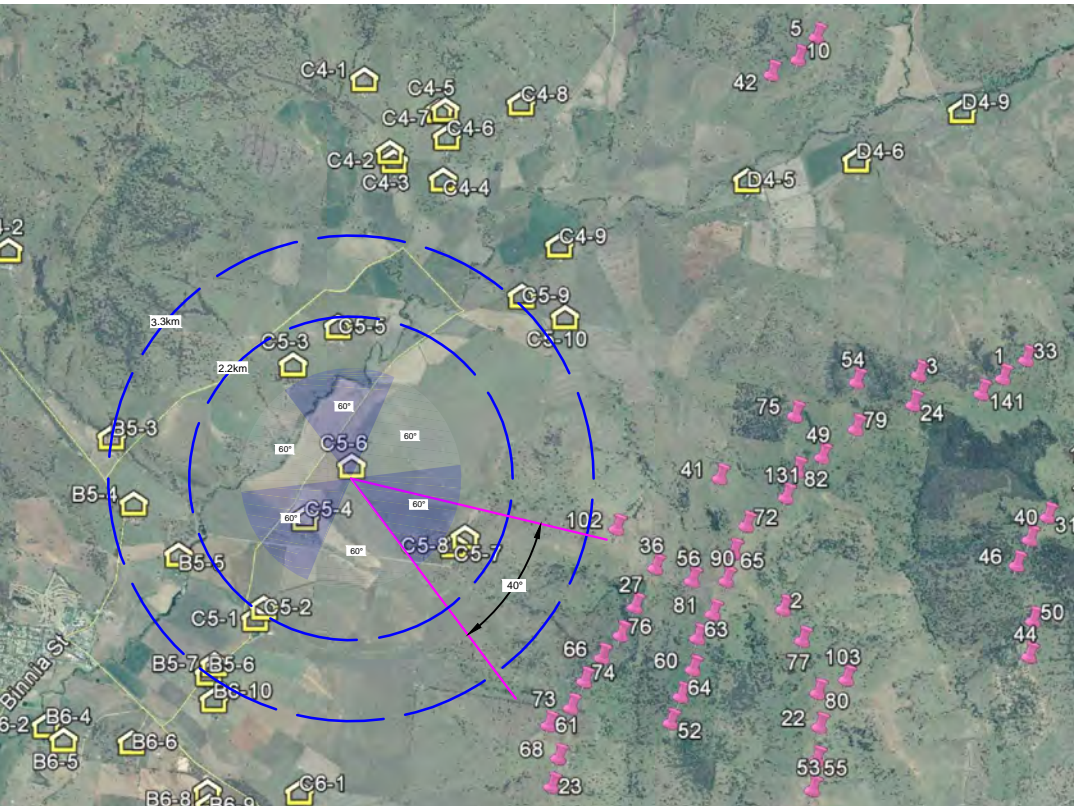
Note: The number of visible wind turbine tips and hubs depicted in the wireframe model does not take into account the location and potential screening influence of existing tree cover, including planting proximate to, or beyond, residential dwellings.

Background wind turbines in excess of 9 km from C5-6

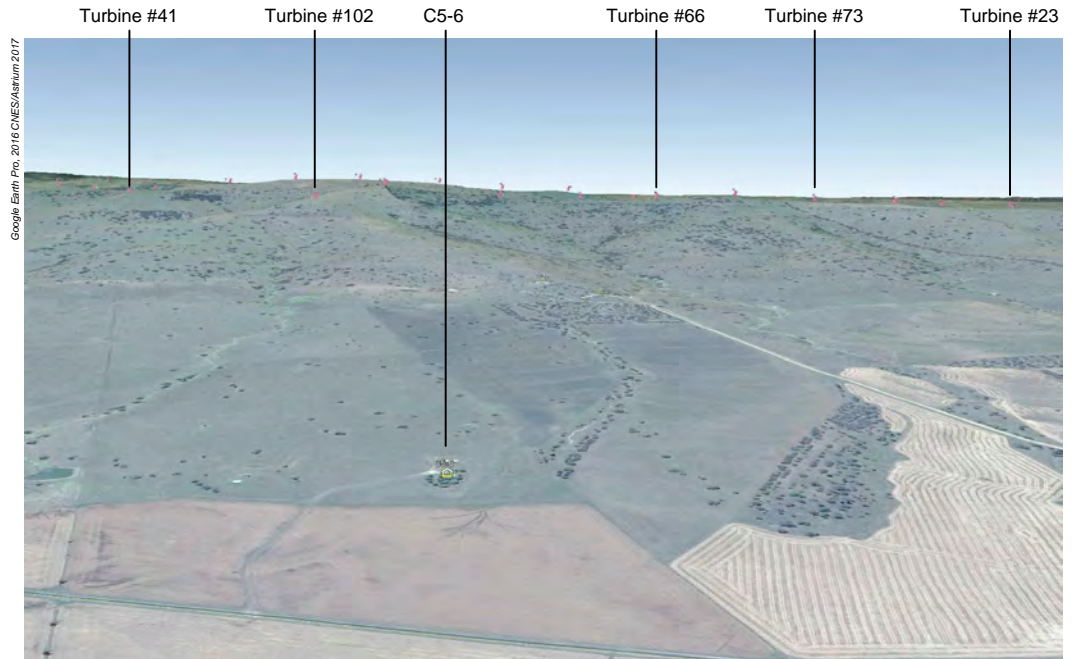
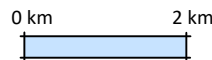


Residential dwelling C5-6 wireframe.

Approximate 40 degree field of view east to south east from residential dwelling C5-6. Distance to closest wind turbine (#102) 3,561 metres. Visibility does not account for existing tree cover between dwelling and wind turbine, including existing tree planting within proximity to the residential dwelling. Blue wind turbines are visible or partially visible to tip of blade. Red wind turbines are screened by landform.



Residential dwelling C5-6 location plan



Residential dwelling C5-6 aerial oblique.

The aerial oblique illustrates typical landform characteristics and location of existing tree cover between C5-6 and surrounding wind turbines. The extent of wind turbines illustrated in the aerial oblique does not represent the potential visibility of wind turbines from the dwelling.

Note:

The landform illustrated in the green wireframe model occurs between the residential dwelling and the wind turbines. Sections of blue wind turbines will not be visible where indicated within or below the green wireframe model. Views will only extend toward sections of blue wind turbines where they occur above the green wireframe model.

Figure 7 Dwelling C5-6 Wireframe analysis

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Uninvolved dwelling C5-9 (Willania)

LVIA V3 March 2014

The LVIA V3 March 2014 included an assessment of dwelling C5-9 within view location L4 located to the south of Coolah Creek Road. The LVIA V3 March 2014 noted that *'Views extent along and across valleys toward wind turbines located on hilltop and ridgeline areas. Some residential dwellings will have partial screening through tree planting surrounding dwellings'*. The LVIA V3 March 2014 determined that dwellings within view location L4 would be subject to a medium level of visual effect.

Further visual assessment:

A supplementary assessment for dwelling C5-9 notes that the dwelling is located to the south of the Coolah Creek Road on relatively level to gently sloping land above the Coolah Creek line. This location affords opportunities for medium to long distance views to surrounding ridgeline locations. Some visual filtering is provided by scattered mature tree cover surrounding the dwelling.

The C5-9 wireframe model (Figure 8) illustrates that around 76 wind turbines would be visible from hub height (and below). Visibility from the C5-9 dwelling is partially screened by tree cover with views extending from the closest wind turbine at around 3,229 metres to more distant groupings including those in excess of 9 kilometres from dwelling C5-9. The wireframe model also indicates that wind turbines would be visible within two 60° sectors.

Further visual assessment has determined that dwelling C5-9 is likely to be impacted by the wind farm and that dwelling C5-9 would be subject to a **medium visual effect** in accordance with the LVIA V3 March 2014.

Wireframe:

Figure 8, C5-9 wireframe information:

Start bearing: 15°, End bearing: 155°

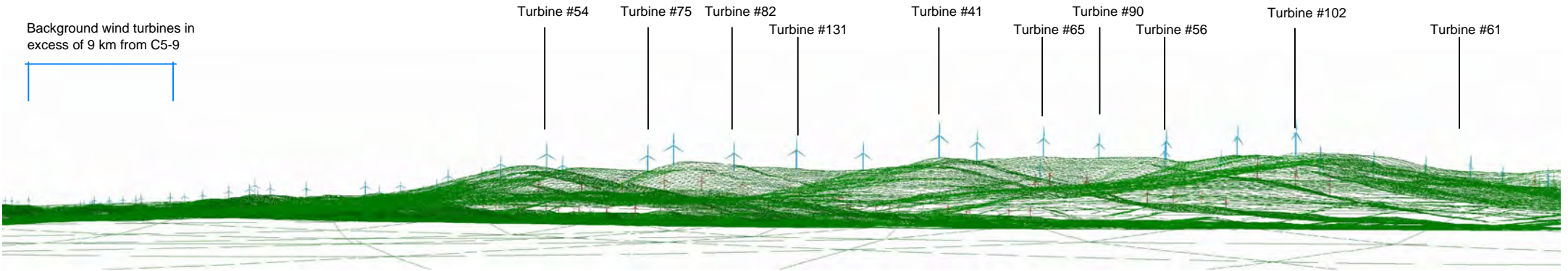
Tips visible: 86

Hubs visible: 76

Closest turbine: Turbine #102 - 3,229m

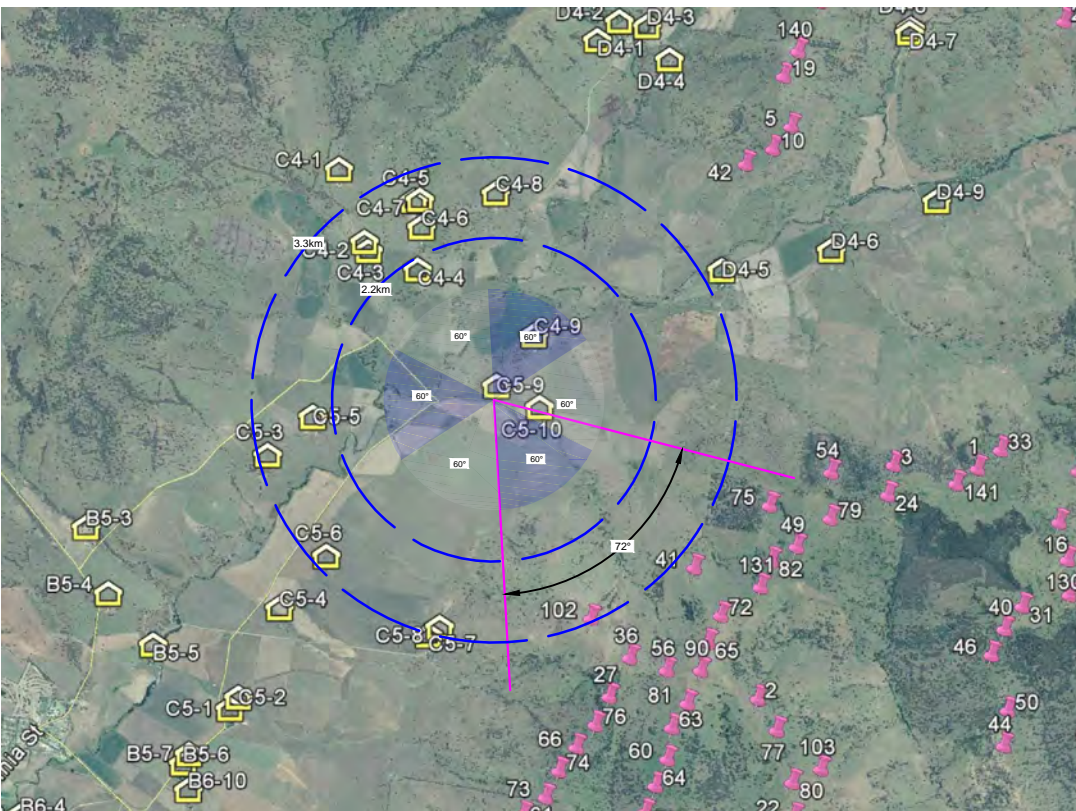
Note: The number of visible wind turbine tips and hubs depicted in the wireframe model does not take into account the location and potential screening influence of existing tree cover, including planting proximate to, or beyond, residential dwellings.

Background wind turbines in excess of 9 km from C5-9

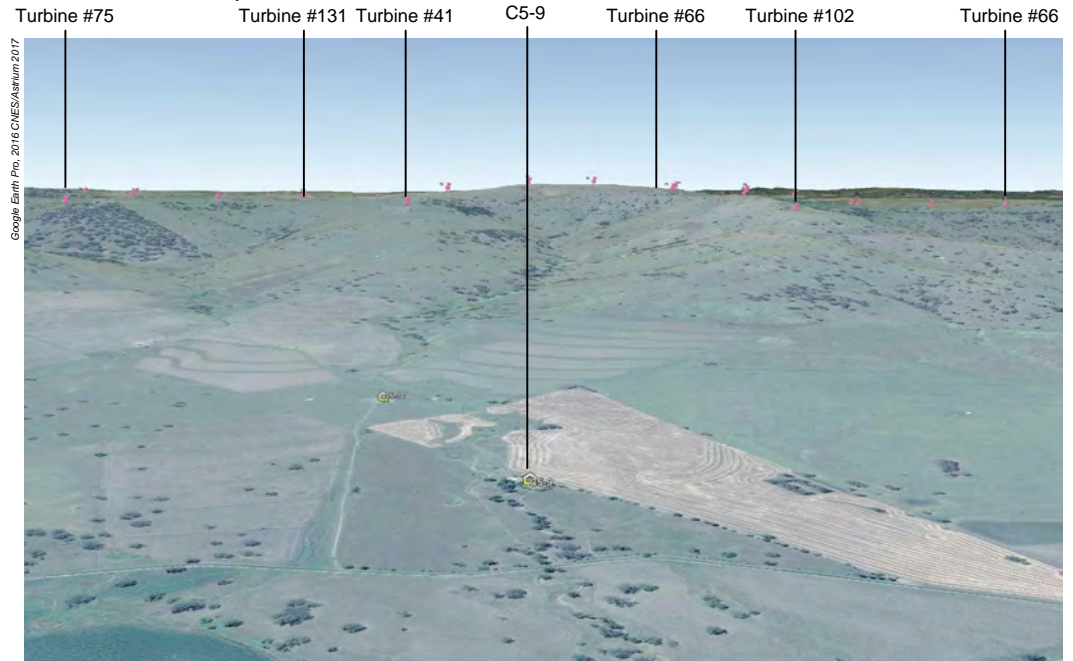
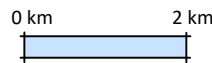


Residential dwelling C5-9 wireframe.

Approximate 72 degree field of view south east from residential dwelling C5-9. Distance to closest wind turbine (#102) 3,229 metres. Visibility does not account for existing tree cover between dwelling and wind turbine, including existing tree planting within proximity to the residential dwelling. Blue wind turbines are visible or partially visible to tip of blade. Red wind turbines are screened by landform.



Residential dwelling C5-9 location plan



Residential dwelling C5-9 aerial oblique.

The aerial oblique illustrates typical landform characteristics and location of existing tree cover between C5-9 and surrounding wind turbines. The extent of wind turbines illustrated in the aerial oblique does not represent the potential visibility of wind turbines from the dwelling.

Note:

The landform illustrated in the green wireframe model occurs between the residential dwelling and the wind turbines. Sections of blue wind turbines will not be visible where indicated within or below the green wireframe model. Views will only extend toward sections of blue wind turbines where they occur above the green wireframe model.

Figure 8 Dwelling C5-9 Wireframe analysis

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Uninvolved dwelling C6-3 (Collie Blue)

LVIA V3 March 2014

The LVIA V3 March 2014 included an assessment of dwelling C6-3 within view location L3 located to the north of Cassilis Road. The LVIA V3 March 2014 noted that '*Views will extend along and across valleys toward wind turbines located on hilltop and ridgeline areas. Some residential dwellings will have partial screening through tree planting surrounding dwellings*'. The LVIA V3 March 2014 determined that dwellings within view location L3 would be subject to a medium level of visual effect.

Further visual assessment:

A supplementary assessment for dwelling C6-3 notes that the dwelling is located north and adjacent to the Cassilis Road corridor on a gently sloping landform. This location affords opportunities for medium to long distance views to surrounding ridgeline locations. The C6-3 wireframe model (Figure 9) illustrate that around 28 wind turbines would be visible from hub height (and below). Views will extend toward the closest wind turbine at around 2,284 metres to more distant groupings from dwelling C6-3. The wireframe model also indicates that wind turbines would be visible within two 60° sectors.

Further visual assessment has determined that dwelling C6-3 is likely to be impacted by the wind farm and that dwelling C6-3 would be subject to a **medium visual effect** in accordance with the LVIA V3 March 2014.

Wireframe:

Figure 9, C6-3 wireframe information:

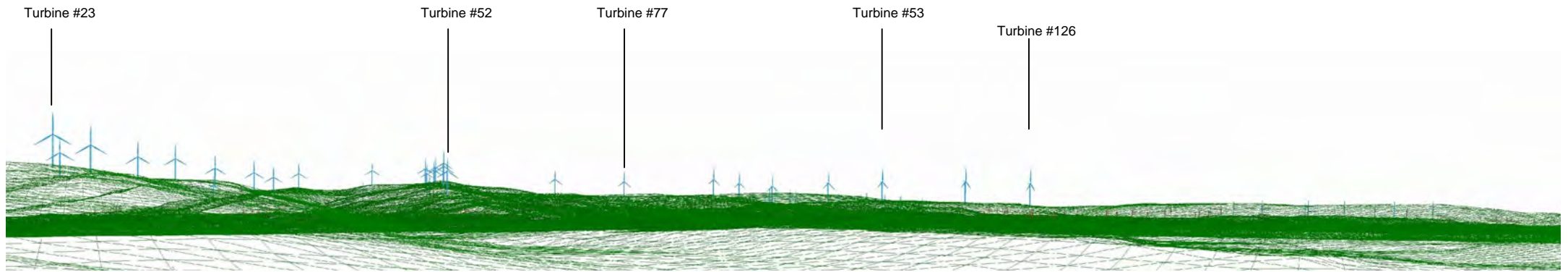
Start bearing: 365°, End bearing: 135°

Tips visible: 58

Hubs visible: 28

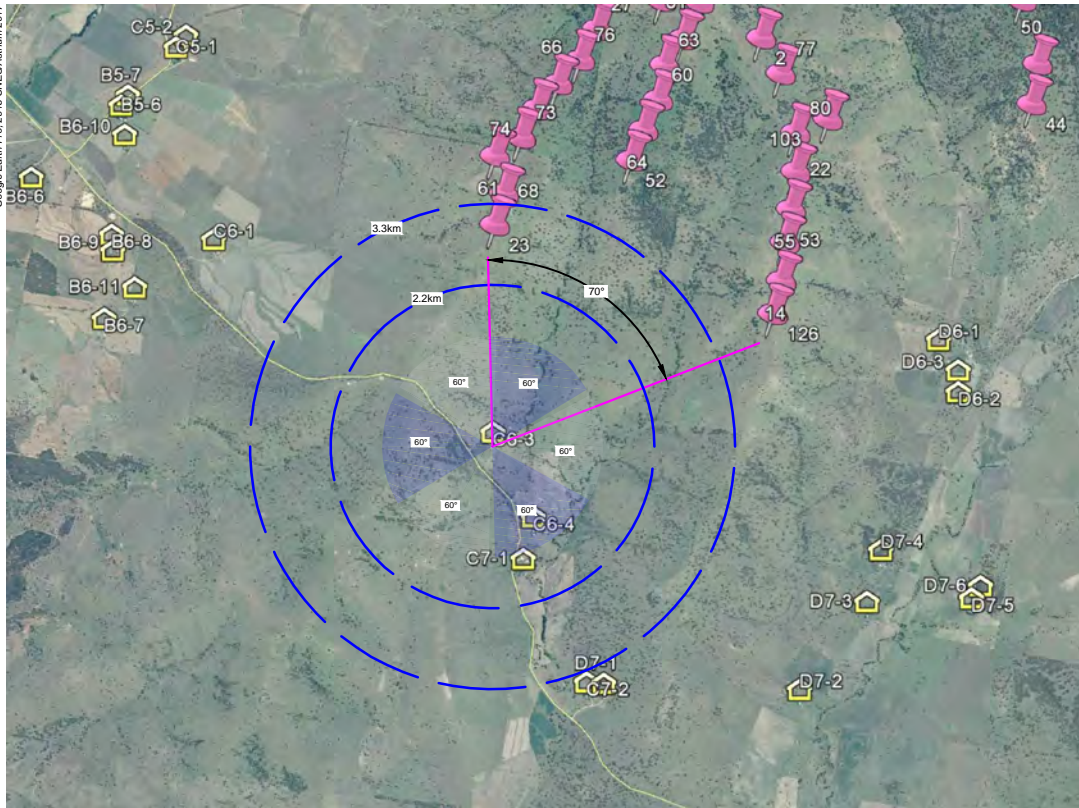
Closest turbine: Turbine #23 - 2,284m

Note: The number of visible wind turbine tips and hubs depicted in the wireframe model does not take into account the location and potential screening influence of existing tree cover, including planting proximate to, or beyond, residential dwellings.

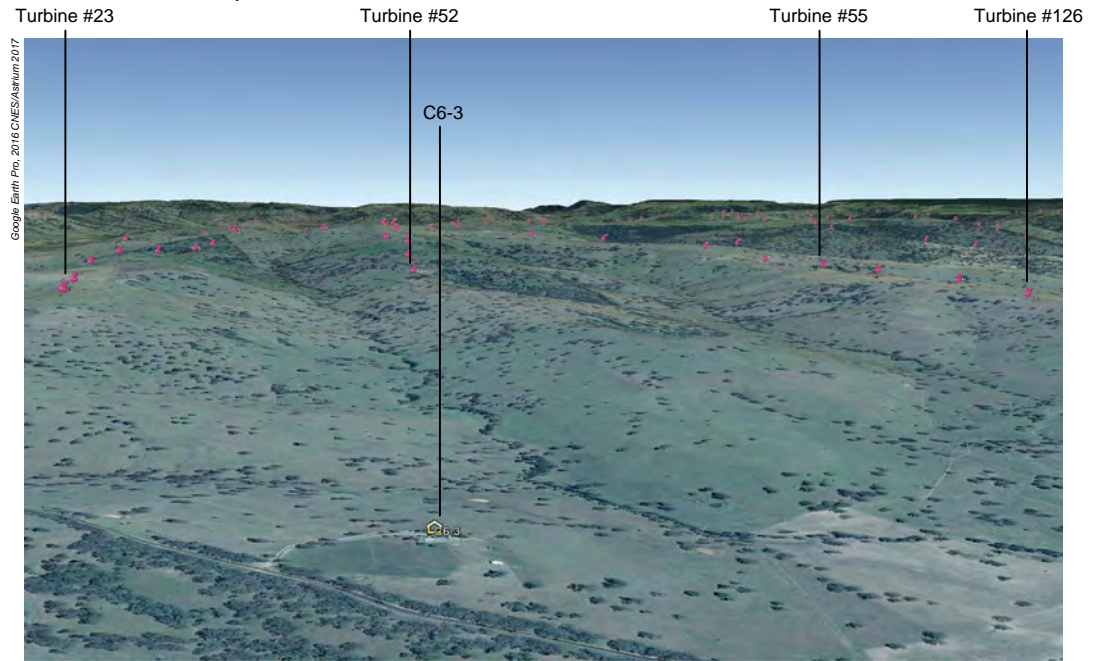
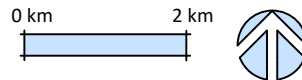


Residential dwelling C6-3 wireframe.

Approximate 70 degree field of view south east from residential dwelling C6-3. Distance to closest wind turbine (#23) 2,284 metres. Visibility does not account for existing tree cover between dwelling and wind turbine, including existing tree planting within proximity to the residential dwelling. Blue wind turbines are visible or partially visible to tip of blade. Red wind turbines are screened by landform.



Residential dwelling C6-3 location plan



Residential dwelling C6-3 aerial oblique.

The aerial oblique illustrates typical landform characteristics and location of existing tree cover between C6-3 and surrounding wind turbines. The extent of wind turbines illustrated in the aerial oblique does not represent the potential visibility of wind turbines from the dwelling.

Note:

The landform illustrated in the green wireframe model occurs between the residential dwelling and the wind turbines. Sections of blue wind turbines will not be visible where indicated within or below the green wireframe model. Views will only extend toward sections of blue wind turbines where they occur above the green wireframe model.

Figure 9 Dwelling C6-3 Wireframe analysis

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Involved dwelling D4-9 (Gynawah)

LVIA V3 March 2014

The LVIA V3 March 2014 included an assessment of dwelling D4-9. The LVIA V3 March 2014 noted that *'short distance views extend toward wind turbines along surrounding ridgelines'*. The LVIA V3 March 2014 determined that the D4-9 dwelling would be subject to a medium to high level of visual effect.

Further visual assessment:

A supplementary assessment for dwelling D4-9 notes that the dwelling is located south and adjacent to the Coolah Creek Road on relatively level ground above the Coolah Creek line. This location affords opportunities for medium to long distance views to surrounding ridgeline locations.

The D4-9 wireframe model (Figures 10 and 11) illustrate that around 78 wind turbines would be visible from hub height (and below). Views will extend toward the closest wind turbine at around 2,200 metres to more distant groupings including those in excess of 6.5 kilometres from dwelling D4-9.

Further visual assessment has determined that dwelling D4-9 is likely to be impacted by the wind farm and that dwelling D4-9 would be subject to a **medium to high visual effect** in accordance with the LVIA V3 March 2014. This assessment also notes that dwelling D4-9 is an involved landowner.

Wireframe:

Figures 10 and 11, D4-9 wireframe information:

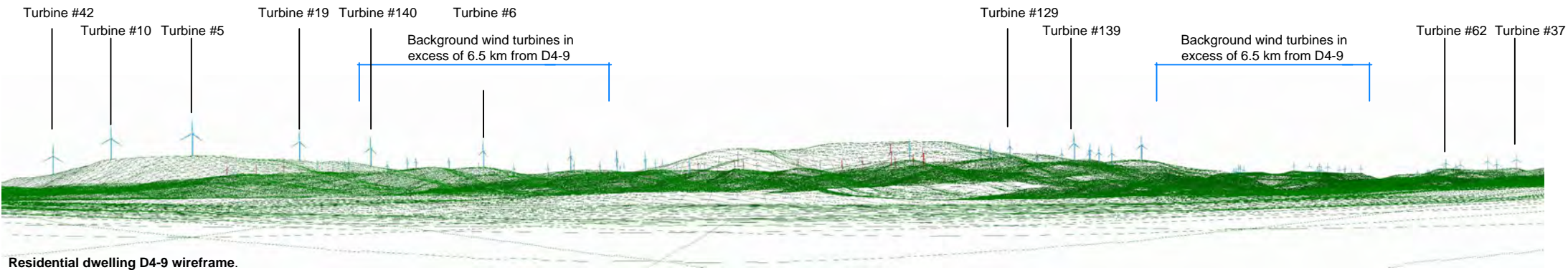
Start bearing: 278°, End bearing: 226°

Tips visible: 98

Hubs visible: 78

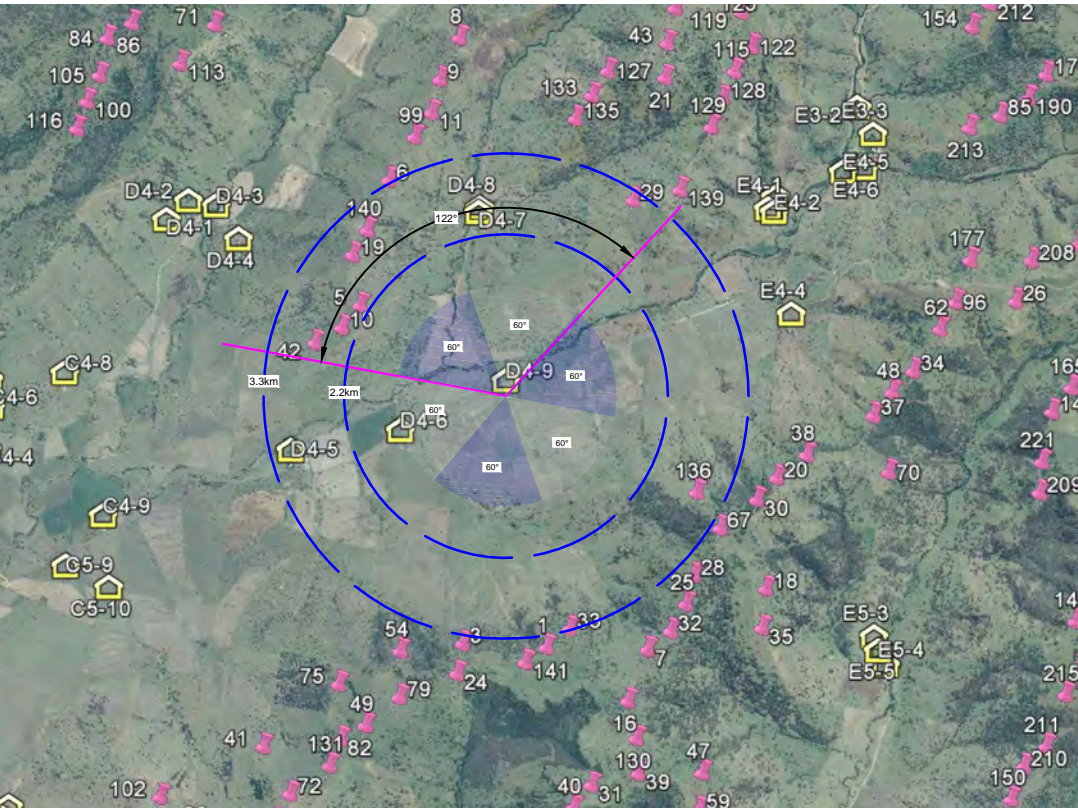
Closest turbine: Turbine #10 - 2,200m (north to north west) Turbine #136 – 2,830 (south east).

Note: The number of visible wind turbine tips and hubs depicted in the wireframe model does not take into account the location and potential screening influence of existing tree cover, including planting proximate to, or beyond, residential dwellings.

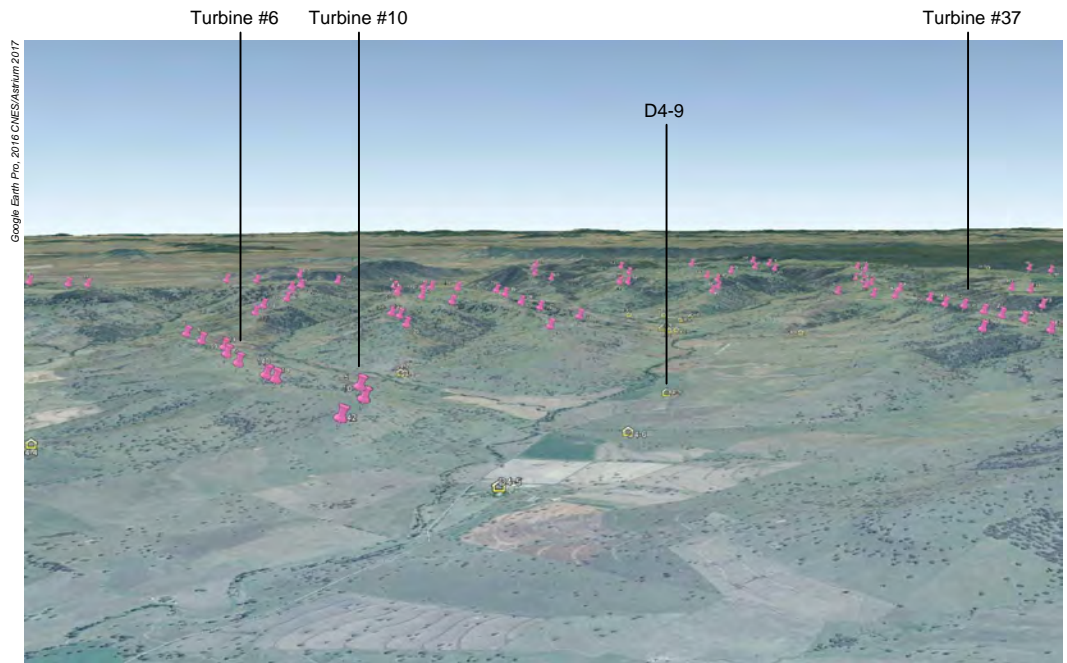
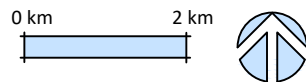


Residential dwelling D4-9 wireframe.

Approximate 122 degree field of view north west to north east from residential dwelling D4-9. Distance to closest wind turbine (#10) 2,200 metres. Visibility does not account for existing tree cover between dwelling and wind turbine, including existing tree planting within proximity to the residential dwelling. Blue wind turbines are visible or partially visible to tip of blade. Red wind turbines are screened by landform.



Residential dwelling D4-9 location plan



Residential dwelling D4-9 aerial oblique.

The aerial oblique illustrates typical landform characteristics and location of existing tree cover between D4-9 and surrounding wind turbines. The extent of wind turbing illustrated in the aerial oblique does not represent the potential visibility of wind turbines from the dwelling.

Note:

The landform illustrated in the green wireframe model occurs between the residential dwelling and the wind turbines. Sections of blue wind turbines will not be visible where indicated within or below the green wireframe model. Views will only extend toward sections of blue wind turbines where they occur above the green wireframe model.

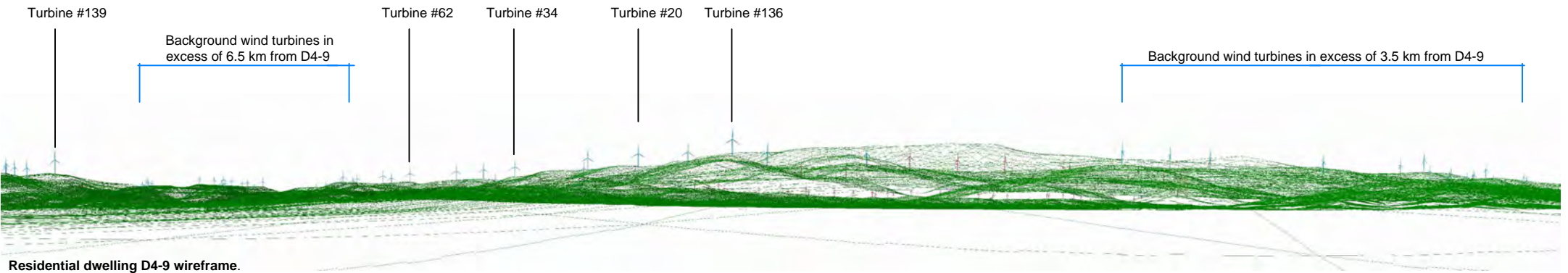
Figure 10 D4-9 Wireframe analysis

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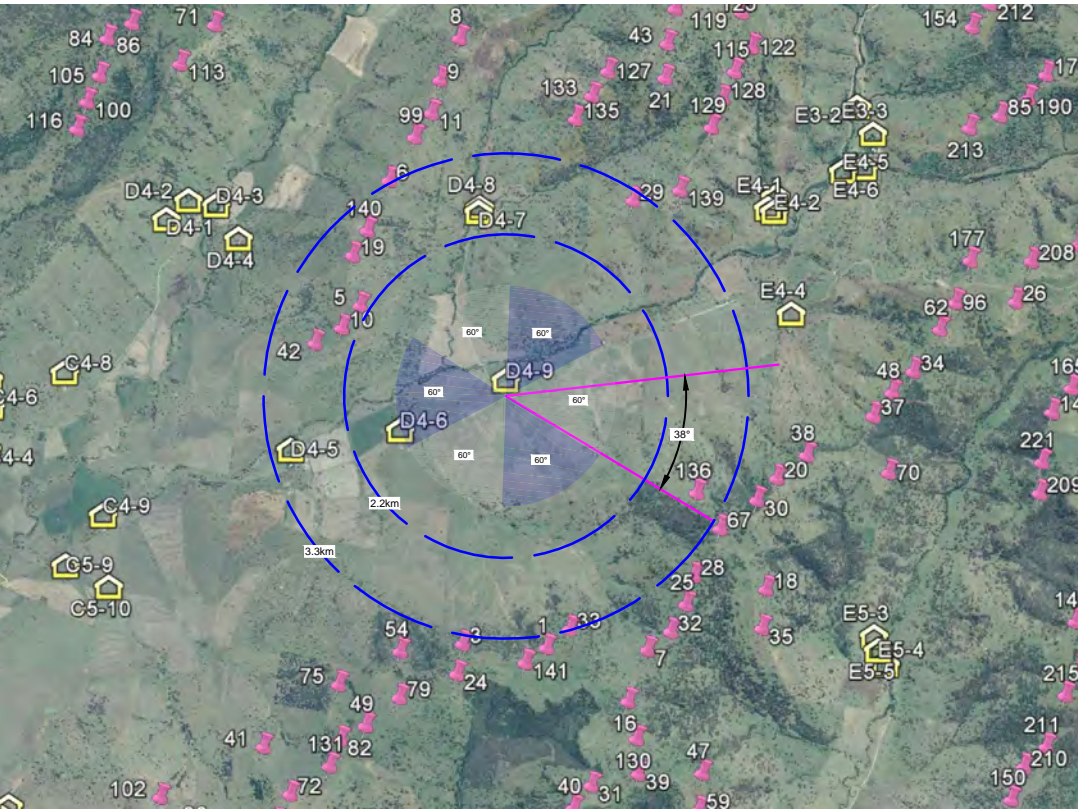
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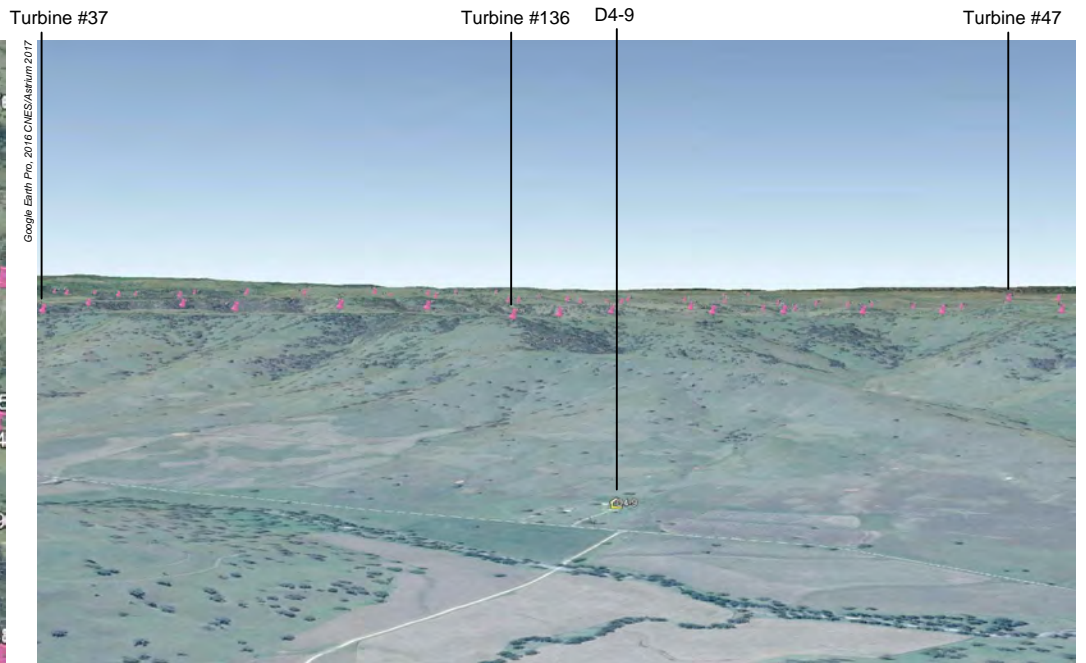
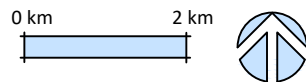


Residential dwelling D4-9 wireframe.

Approximate 38 degree field of view south east from residential dwelling D4-9. Distance to closest wind turbine (#136) 2,860 metres. Visibility does not account for existing tree cover between dwelling and wind turbine, including existing tree planting within proximity to the residential dwelling. Blue wind turbines are visible or partially visible to tip of blade. Red wind turbines are screened by landform.



Residential dwelling D4-9 location plan



Residential dwelling D4-9 aerial oblique.

The aerial oblique illustrates typical landform characteristics and location of existing tree cover between D4-9 and surrounding wind turbines. The extent of wind turbines illustrated in the aerial oblique does not represent the potential visibility of wind turbines from the dwelling.

Note:

The landform illustrated in the green wireframe model occurs between the residential dwelling and the wind turbines. Sections of blue wind turbines will not be visible where indicated within or below the green wireframe model. Views will only extend toward sections of blue wind turbines where they occur above the green wireframe model.

Figure 11 D4-9 Wireframe analysis

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Involved dwelling D7-2

LVIA V3 March 2014

The LVIA V3 March 2014 included an assessment of dwelling D7-2 within view location L2 located to the west of Turee Vale Road. The LVIA V3 March 2014 noted that for view location L2 *'views will extend along and across valleys toward wind turbines located on hilltop and ridgeline areas. Some residential dwellings will have partial screening through tree planting surrounding dwellings'*. The LVIA V3 March 2014 determined that the L2 view location would be subject to a medium level of visual effect.

Further visual assessment:

A supplementary assessment for dwelling D7-2 notes that the dwelling is located west and adjacent to the Turee Vale Road on gently sloping ground above the Turee Creek line. This location affords opportunities for medium to long distance views to surrounding ridgeline locations; however, views toward wind turbines to the west of Turee Creek will be partially screened by landform rising to the north of the dwelling as well as mature tree planting around the dwelling.

The D7-2 wireframe model (Figure 12) illustrates that around 76 wind turbines would be visible from hub height (and below). Views will extend toward the closest wind turbine at around 4,280 metres to more distant groupings including those in excess of 7 kilometres from dwelling D7-2. The wireframe model also indicates that wind turbines would be visible within two 60° sectors.

Further visual assessment has determined that dwelling D7-2 is likely to be impacted by the wind farm and that dwelling D7-2 would be subject to a **medium visual effect** in accordance with the LVIA V3 March 2014. This assessment also notes that dwelling D7-2 is subject to an agreement.

Wireframe:

Figure 12, D7-2 wireframe information:

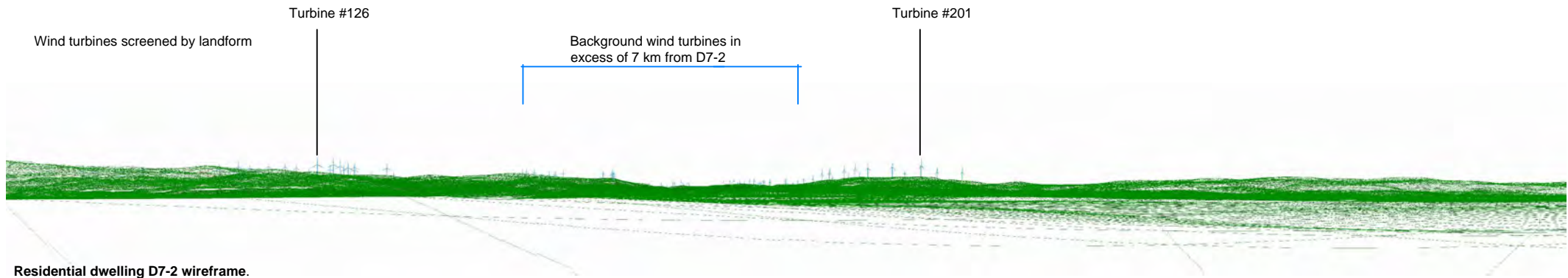
Start bearing: 320°, End bearing: 140°

Tips visible:107

Hubs visible:76

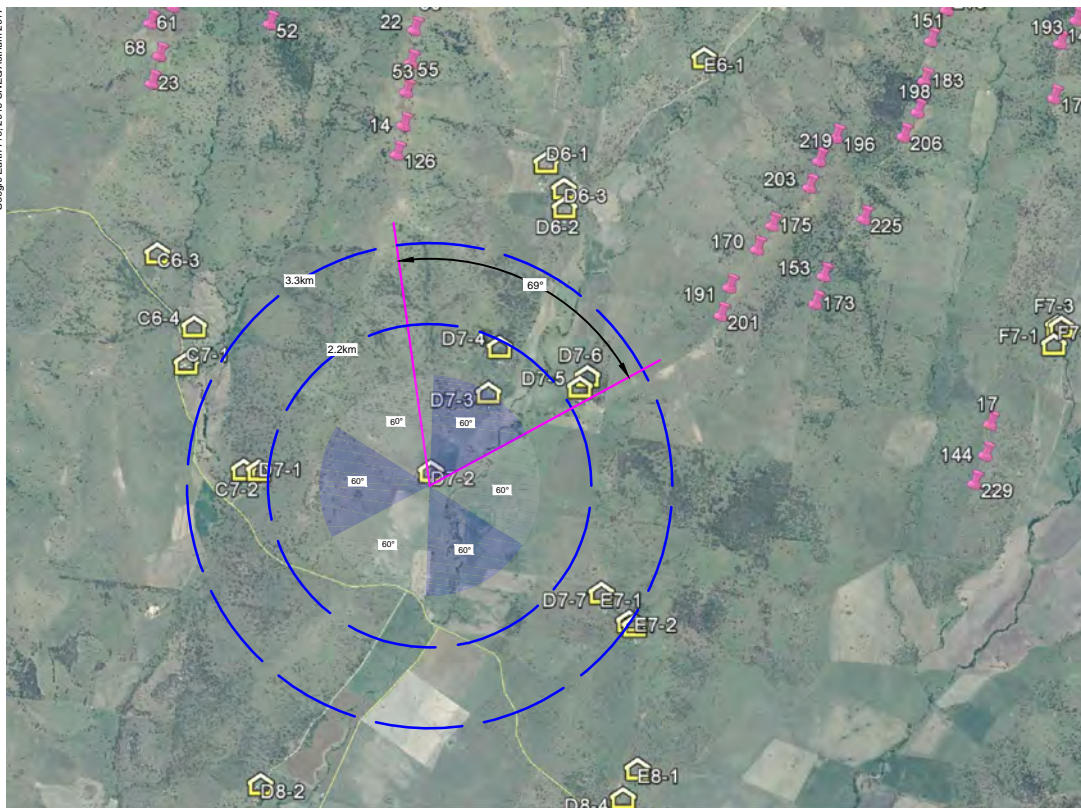
Closest turbine: Turbine #201 - 4,280

Note: The number of visible wind turbine tips and hubs depicted in the wireframe model does not take into account the location and potential screening influence of existing tree cover, including planting proximate to, or beyond, residential dwellings.

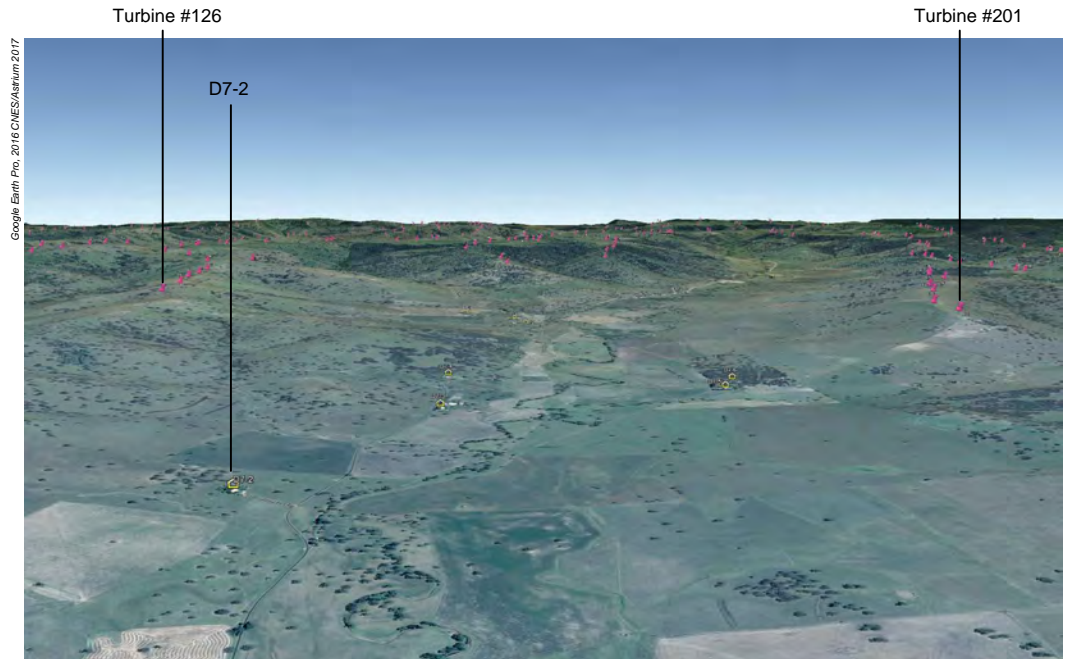
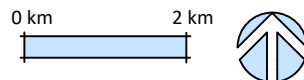


Residential dwelling D7-2 wireframe.

Approximate 69 degree field of view north from residential dwelling D7-2. Distance to closest wind turbine (#201) 4,280 metres. Visibility does not account for existing tree cover between dwelling and wind turbine, including existing tree planting within proximity to the residential dwelling. Blue wind turbines are visible or partially visible to tip of blade. Red wind turbines are screened by landform.



Residential dwelling D7-2 location plan



Residential dwelling D7-2 aerial oblique.

The aerial oblique illustrates typical landform characteristics and location of existing tree cover between D7-2 and surrounding wind turbines. The extent of wind turbines illustrated in the aerial oblique does not represent the potential visibility of wind turbines from the dwelling.

Note:

The landform illustrated in the green wireframe model occurs between the residential dwelling and the wind turbines. Sections of blue wind turbines will not be visible where indicated within or below the green wireframe model. Views will only extend toward sections of blue wind turbines where they occur above the green wireframe model.

Figure 12 Dwelling D7-2 Wireframe analysis

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Uninvolved dwelling D7-4 (Cooinda)

LVIA V3 March 2014

The LVIA V3 March 2014 included an assessment of dwelling D7-4 within view location L2 located to the west of Turee Vale Road. The LVIA V3 March 2014 noted that for view location L2 *'views will extend along and across valleys toward wind turbines located on hilltop and ridgeline areas. Some residential dwellings will have partial screening through tree planting surrounding dwellings'*. The LVIA V3 March 2014 determined that the L2 view location would be subject to a medium level of visual effect.

Further visual assessment:

A supplementary assessment for dwelling D7-4 notes that the dwelling is located west and adjacent to the Turee Vale Road on gently sloping ground above the Turee Creek line. This location affords opportunities for medium distance views to surrounding ridgeline locations; however, views toward wind turbines to the west of Turee Creek and north of the dwelling will be partially screened by landform rising to the north as well as mature tree planting beyond the dwelling.

The D7-4 wireframe analysis (Figure 13) illustrates that around 39 wind turbines would be visible from hub height (and below). Views will extend toward the closest wind turbine at around 2,920 metres to more distant groupings including those in excess of 6.5 kilometres from dwelling D7-4. The wireframe model also indicates that wind turbines would be visible within one 60° sector.

Further visual assessment has determined that dwelling D7-4 is likely to be impacted by the wind farm and that dwelling D7-4 would be subject to a **medium visual effect** in accordance with the LVIA V3 March 2014.

Wireframe:

Figure 13, D7-4 wireframe information:

Start bearing: 304°, End bearing: 150°

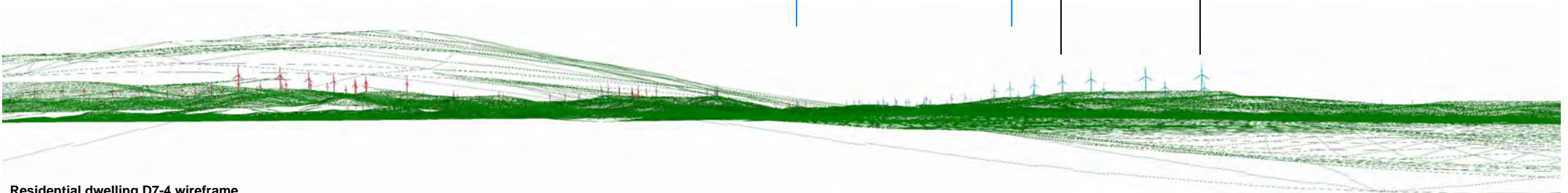
Tips visible: 50

Hubs visible: 39

Closest turbine: Turbine #201 - 2,926m

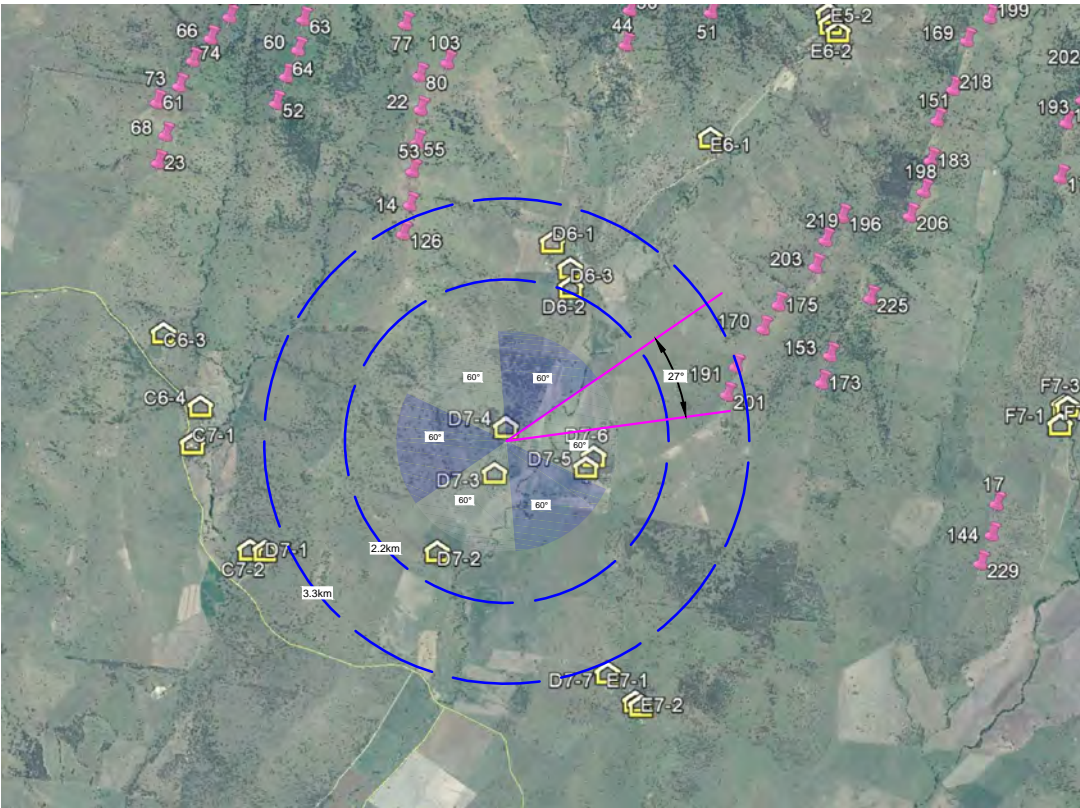
Note: The number of visible wind turbine tips and hubs depicted in the wireframe model does not take into account the location and potential screening influence of existing tree cover, including planting proximate to, or beyond, residential dwellings.

Wind turbines screened by landform

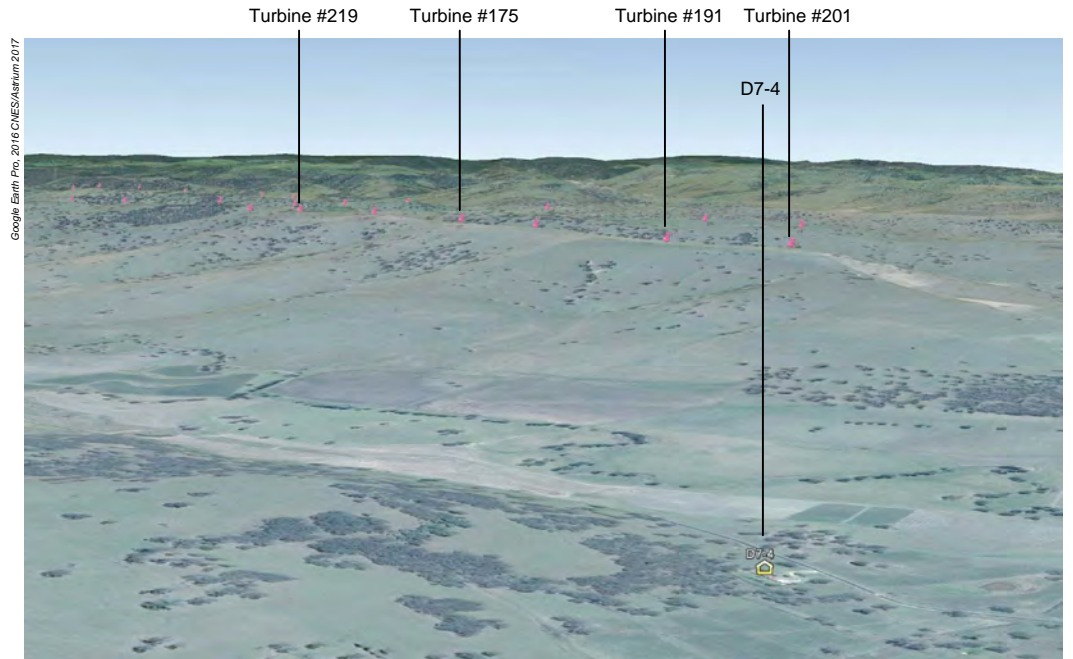
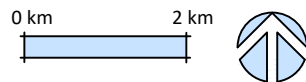


Residential dwelling D7-4 wireframe.

Approximate 27 degree field of view north west to north east from residential dwelling D7-4. Distance to closest wind turbine (#201) 2,962 metres. Visibility does not account for existing tree cover between dwelling and wind turbine, including existing tree planting within proximity to the residential dwelling. Blue wind turbines are visible or partially visible to tip of blade. Red wind turbines are screened by landform.



Residential dwelling D7-4 location plan



Residential dwelling D7-4 aerial oblique.

The aerial oblique illustrates typical landform characteristics and location of existing tree cover between D7-4 and surrounding wind turbines. The extent of wind turbines illustrated in the aerial oblique does not represent the potential visibility of wind turbines from the dwelling.

Note:

The landform illustrated in the green wireframe model occurs between the residential dwelling and the wind turbines. Sections of blue wind turbines will not be visible where indicated within or below the green wireframe model. Views will only extend toward sections of blue wind turbines where they occur above the green wireframe model.

Figure 13 Dwelling D7-4 Wireframe analysis

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Uninvolved dwelling E9-4 (Rangeview)

LVIA V3 March 2014

The LVIA V3 March 2014 included an assessment of dwelling E9-4 within view location L2 located to the east of Cassilis Road. The LVIA V3 March 2014 noted that for view location L2 *'views will extend along and across valleys toward wind turbines located on hilltop and ridgeline areas. Some residential dwellings will have partial screening through tree planting surrounding dwellings'*. The LVIA V3 March 2014 determined that the L2 view location would be subject to a medium level of visual effect.

Further visual assessment:

A supplementary assessment for dwelling E9-4 notes that the dwelling is located to the east and above the Cassilis Road corridor, on top of a low timbered spur extending north south. This location affords opportunities for medium to long distance views to surrounding ridgeline locations. However, views toward wind turbines will be partially screened by landform as well as mature scattered tree planting beyond the dwelling.

The E9-4 wireframe model (Figure 14) illustrates that around 39 wind turbines would be visible from hub height (and below). Views will extend toward the closest wind turbine at around 4,000 metres from dwelling E9-4. The wireframe model also indicates that wind turbines would be visible within one 60° sector.

Further visual assessment has determined that dwelling E9-4 is unlikely to be significantly impacted by the wind farm and that dwelling E9-4 would be subject to a **low to medium visual effect**.

Wireframe:

Figure 14, E9-4 wireframe information:

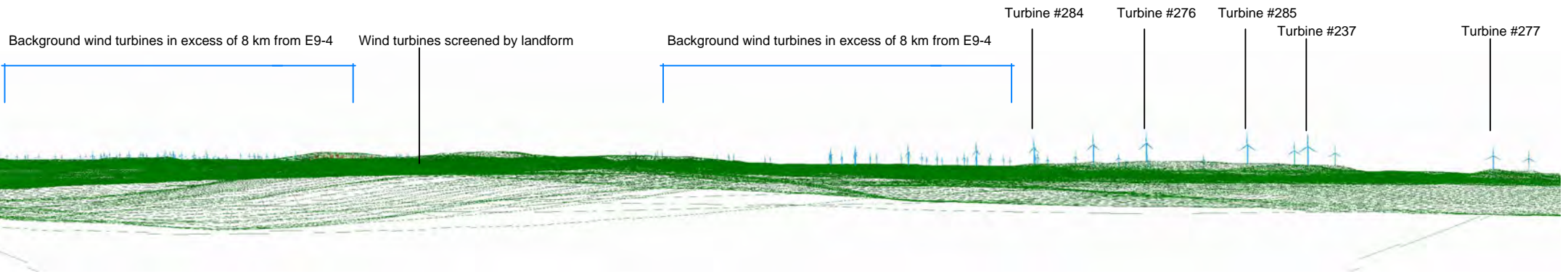
Start bearing: 304°, End bearing: 150°

Tips visible: 50

Hubs visible: 39

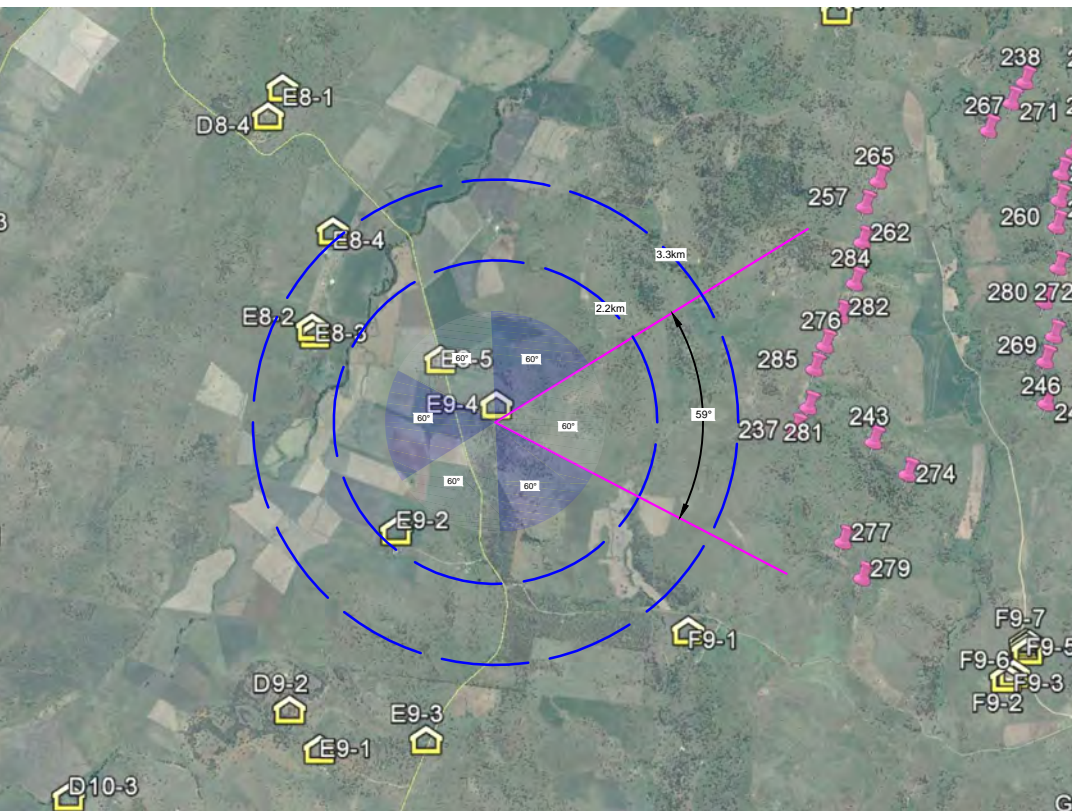
Closest turbine: Turbine #237 – 4,000m

Note: The number of visible wind turbine tips and hubs depicted in the wireframe model does not take into account the location and potential screening influence of existing tree cover, including planting proximate to, or beyond, residential dwellings.

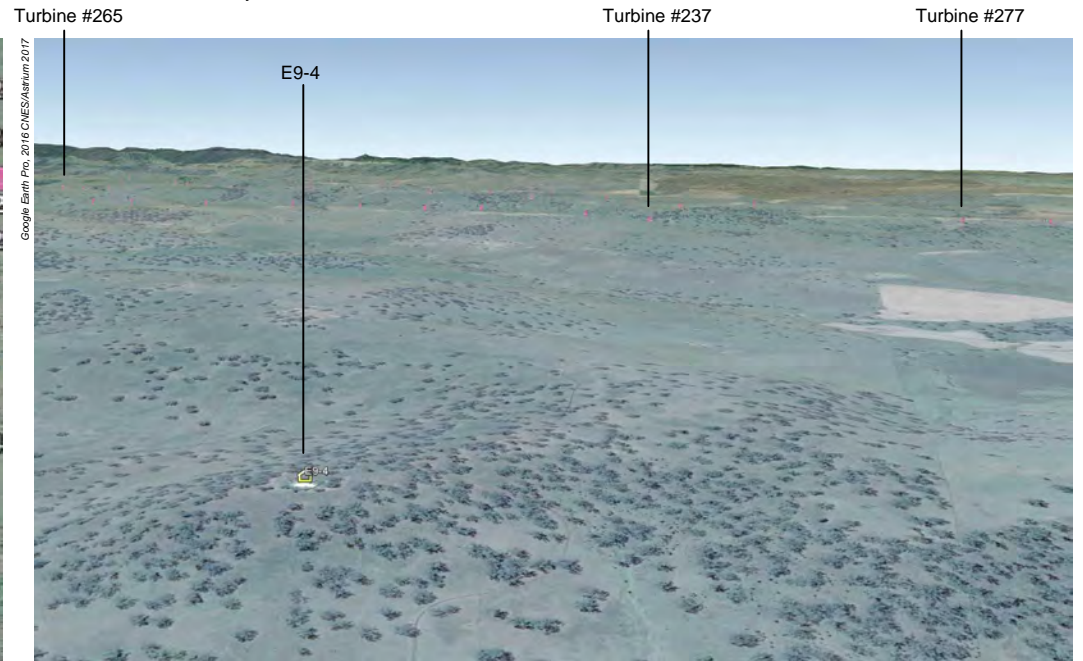
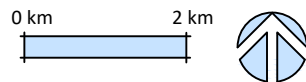


Residential dwelling E9-4 wireframe.

Approximate 59 degree field of view east from residential dwelling E9-4. Distance to closest wind turbine (#237) 4,000 metres. Visibility does not account for existing tree cover between dwelling and wind turbine, including existing tree planting within proximity to the residential dwelling. Blue wind turbines are visible or partially visible to tip of blade. Red wind turbines are screened by landform.



Residential dwelling E9-4 location plan



Residential dwelling E9-4 aerial oblique.

The aerial oblique illustrates typical landform characteristics and location of existing tree cover between E9-4 and surrounding wind turbines. The extent of wind turbines illustrated in the aerial oblique does not represent the potential visibility of wind turbines from the dwelling.

Note:

The landform illustrated in the green wireframe model occurs between the residential dwelling and the wind turbines. Sections of blue wind turbines will not be visible where indicated within or below the green wireframe model. Views will only extend toward sections of blue wind turbines where they occur above the green wireframe model.

Figure 14 Dwelling E9-4 Wireframe analysis

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Uninvolved dwelling F9-1 (Culbara)

LVIA V3 March 2014

The LVIA V3 March 2014 included an assessment of dwelling F9-1 within view location L2 located to the south of Coolah Road.

The LVIA V3 March 2014 noted that for view location L2 *'views will extend along and across valleys toward wind turbines located on hilltop and ridgeline areas. Some residential dwellings will have partial screening through tree planting surrounding dwellings'*.

The LVIA V3 March 2014 determined that the L2 view location would be subject to a medium level of visual effect.

Further visual assessment:

A supplementary assessment for dwelling F9-1 notes that the dwelling is located to the south of the Coolah Road corridor, on gently sloping land. This location affords opportunities for medium to long distance views to surrounding ridgeline locations. However, views toward wind turbines will be partially screened by landform as well as mature scattered tree planting surrounding and beyond the dwelling.

The F9-1 wireframe model (Figure 15) illustrates that around 8 wind turbines would be visible from hub height (and below). Views will extend toward the closest wind turbine at around 2,337 metres from dwelling F9-1. The wireframe model also indicates that wind turbines would be visible within one 60° sector.

Further visual assessment has determined that dwelling F9-1 is unlikely to be significantly impacted by the wind farm and that dwelling F9-1 would be subject to a **low to medium visual effect**.

Wireframe:

Figure 15, F9-1 wireframe information:

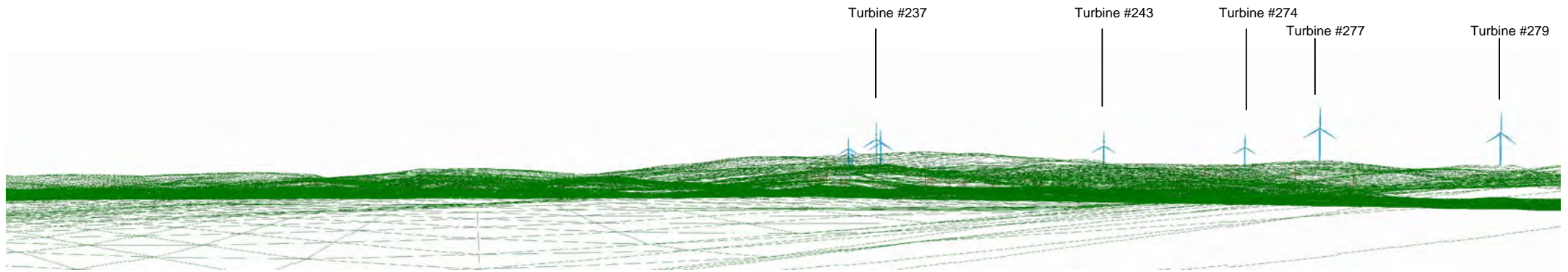
Start bearing: 314°, End bearing: 80°

Tips visible: 10

Hubs visible: 8

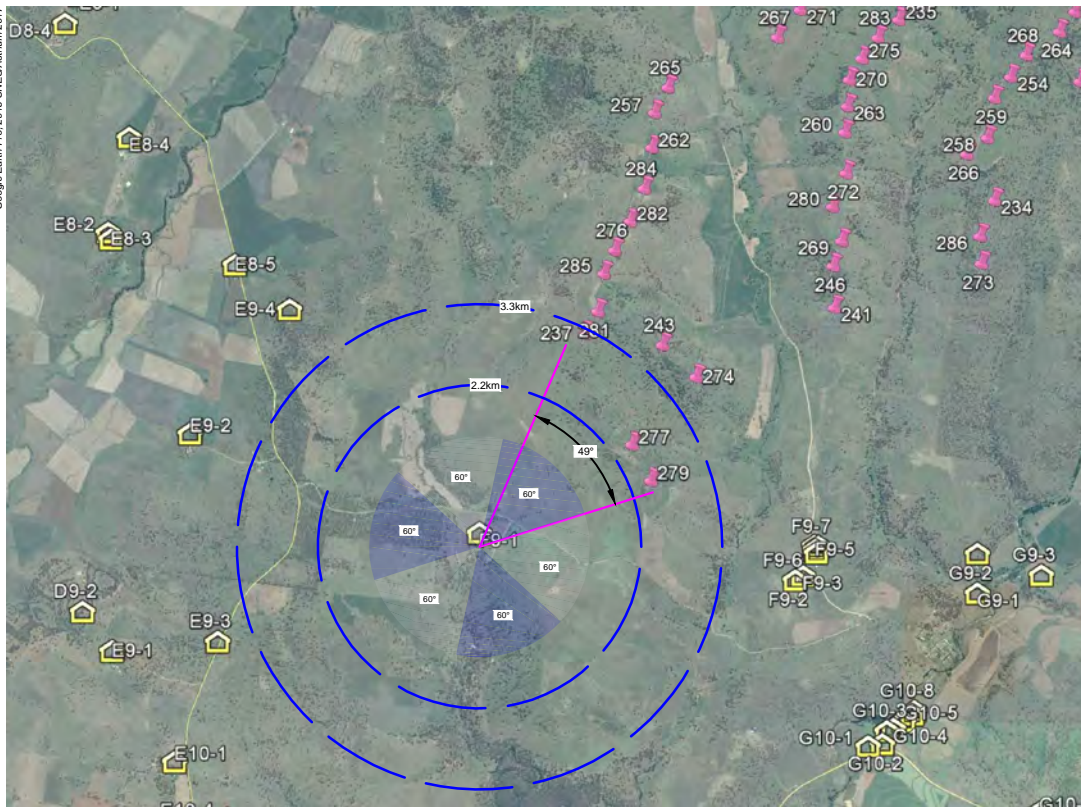
Closest turbine: Turbine #279 - 2,337m

Note: The number of visible wind turbine tips and hubs depicted in the wireframe model does not take into account the location and potential screening influence of existing tree cover, including planting proximate to, or beyond, residential dwellings.

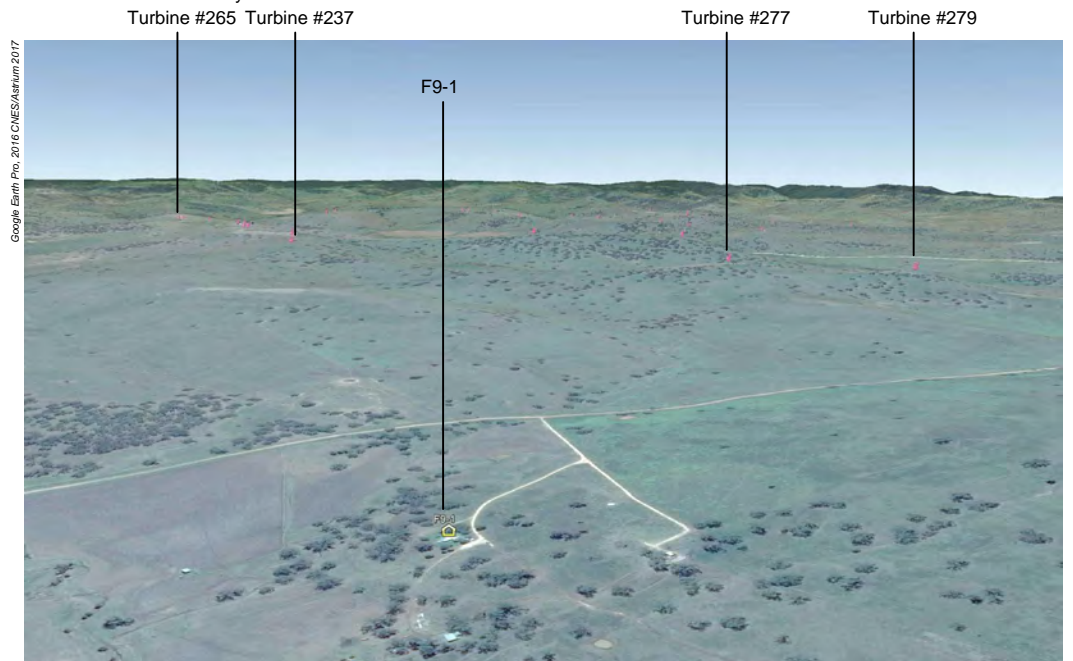
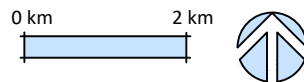


Residential dwelling F9-1 wireframe.

Approximate 49 degree field of view north east from residential dwelling F9-1. Distance to closest wind turbine (#279) 2,337 metres. Visibility does not account for existing tree cover between dwelling and wind turbine, including existing tree planting within proximity to the residential dwelling. Blue wind turbines are visible or partially visible to tip of blade. Red wind turbines are screened by landform.



Residential dwelling F9-1 location plan



Residential dwelling F9-1 aerial oblique.

The aerial oblique illustrates typical landform characteristics and location of existing tree cover between F9-1 and surrounding wind turbines. The extent of wind turbines illustrated in the aerial oblique does not represent the potential visibility of wind turbines from the dwelling.

Note:

The landform illustrated in the green wireframe model occurs between the residential dwelling and the wind turbines. Sections of blue wind turbines will not be visible where indicated within or below the green wireframe model. Views will only extend toward sections of blue wind turbines where they occur above the green wireframe model.

Figure 15 Dwelling F9-1 Wireframe analysis

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Uninvolved dwelling G6-2 (Glenwood)

LVIA V3 March 2014

The LVIA V3 March 2014 included an assessment of dwelling G6-2.

The LVIA V3 March 2014 noted that *'The property has been purchased as an environmental offset and the residential dwelling is unoccupied. Views toward the closest wind turbines are partially screened by vegetation surrounding the residential dwelling'*.

The LVIA V3 March 2014 determined that the G6-2 dwelling would be subject to a low to medium level of visual effect.

Further visual assessment:

A supplementary assessment for dwelling G6-2 notes that the dwelling is located to the west of the Yarrawonga Road corridor, on generally level land. This location affords opportunities for medium to long distance views to surrounding ridgeline locations. However, views toward wind turbines will be partially screened by a rising landform as well as mature scattered tree planting surrounding and beyond the dwelling.

The G6-2 wireframe model (Figure 16) illustrates that around 12 wind turbines would be visible from hub height (and below). Views will extend toward the closest wind turbine at around 1,974 metres from dwelling G6-2. The wireframe model also indicates that wind turbines would be visible within one 60° sector.

Further visual assessment has determined that dwelling G6-2 is unlikely to be significantly impacted by the wind farm and that dwelling G6-2 would be subject to a **low to medium visual effect**.

Wireframe:

Figure 16, G6-2 wireframe information:

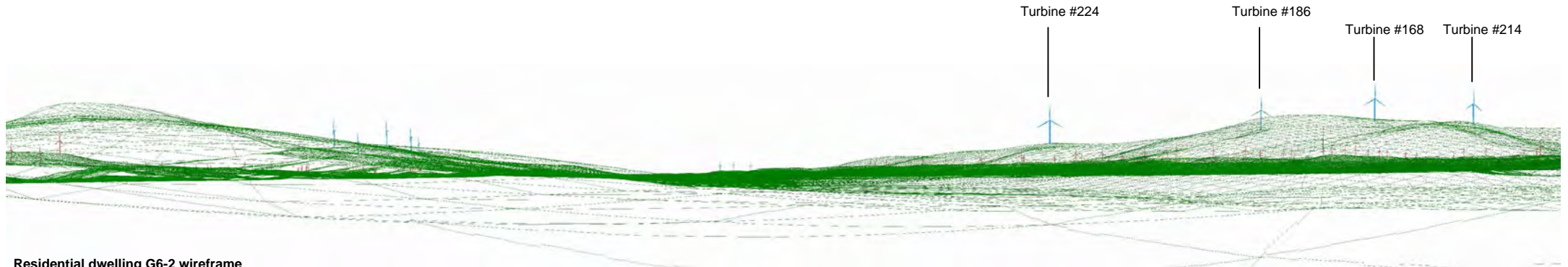
Start bearing: 134°, End bearing: 6°

Tips visible: 17

Hubs visible: 12

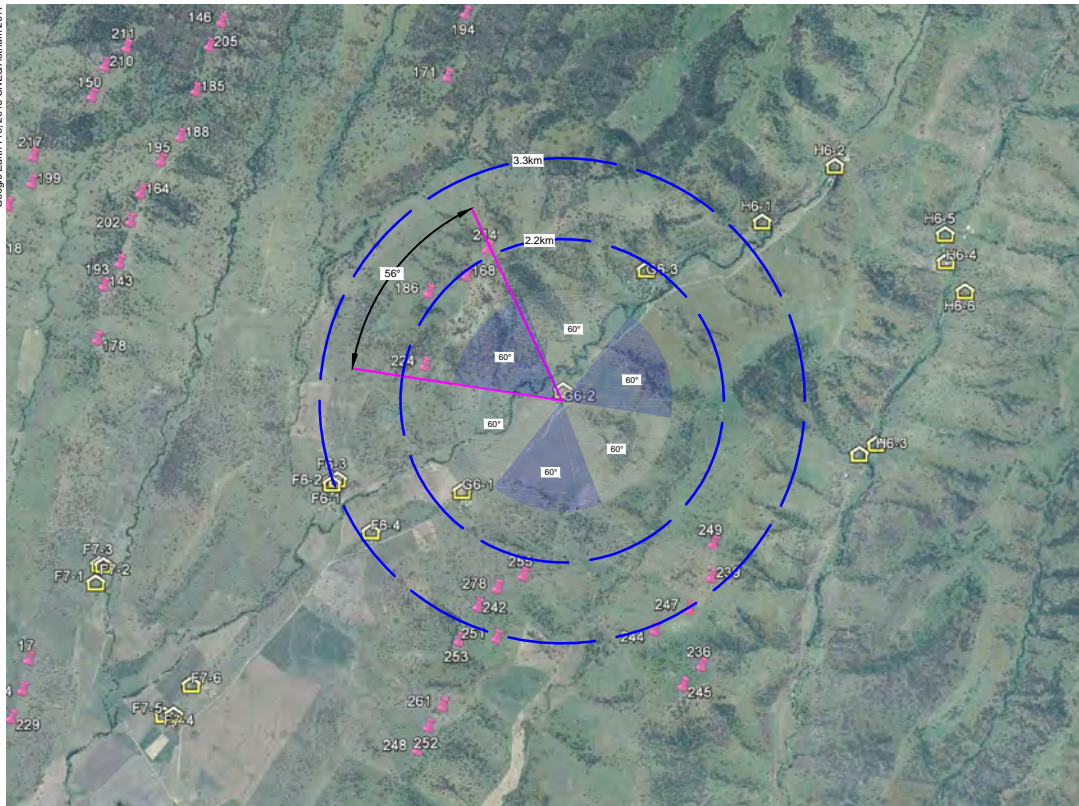
Closest turbine: Turbine #224 - 1,974m

Note: The number of visible wind turbine tips and hubs depicted in the wireframe model does not take into account the location and potential screening influence of existing tree cover, including planting proximate to, or beyond, residential dwellings.

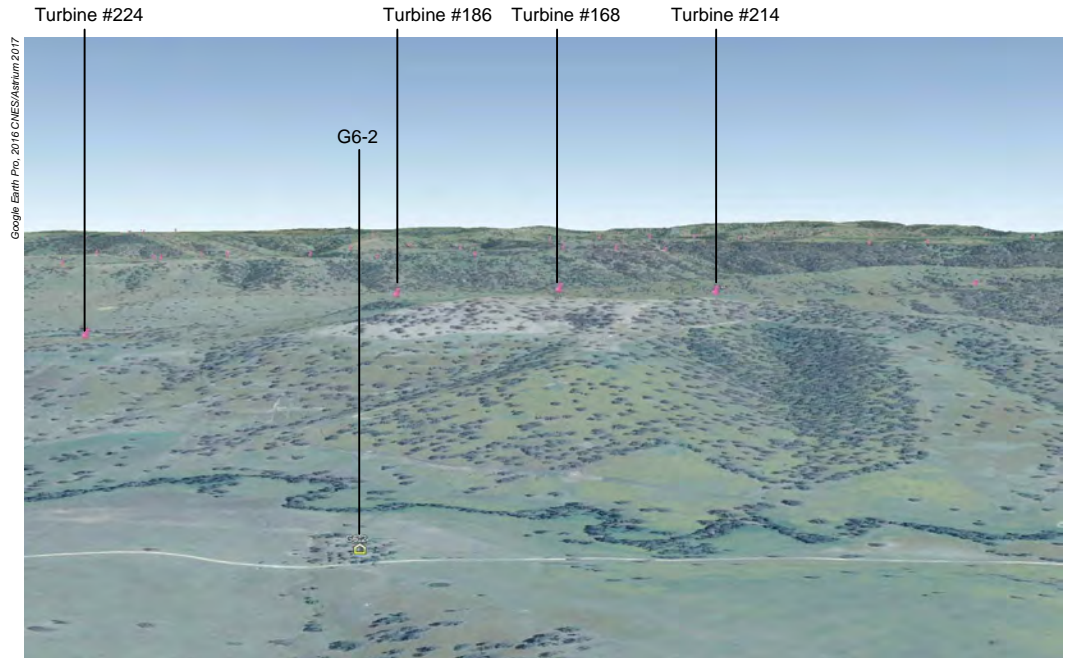
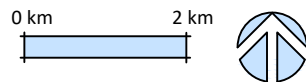


Residential dwelling G6-2 wireframe.

Approximate 56 degree field of view north west from residential dwelling G6-2. Distance to closest wind turbine (#224) 1,974 metres. Visibility does not account for existing tree cover between dwelling and wind turbine, including existing tree planting within proximity to the residential dwelling. Blue wind turbines are visible or partially visible to tip of blade. Red wind turbines are screened by landform.



Residential dwelling G6-2 location plan



Residential dwelling G6-2 aerial oblique.

The aerial oblique illustrates typical landform characteristics and location of existing tree cover between G6-2 and surrounding wind turbines. The extent of wind turbines illustrated in the aerial oblique does not represent the potential visibility of wind turbines from the dwelling.

Note:

The landform illustrated in the green wireframe model occurs between the residential dwelling and the wind turbines. Sections of blue wind turbines will not be visible where indicated within or below the green wireframe model. Views will only extend toward sections of blue wind turbines where they occur above the green wireframe model.

Figure 16 Dwelling G6-2 Wireframe analysis

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Uninvolved dwelling G6-3 (Ellaroy)

LVIA V3 March 2014

The LVIA V3 March 2014 included an assessment of dwelling G6-3 within view location L1 located to the north of Yarrawonga Road.

The LVIA V3 March 2014 noted that for view location L1 *'views toward turbines within the south portion of the project area will be partially screened through a combination of landform and tree cover'*.

The LVIA V3 March 2014 determined that the L1 view location would be subject to a low to medium level of visual effect.

Further visual assessment:

A supplementary assessment for dwelling G6-3 notes that the dwelling is located to the north of the Yarrawonga Road corridor, on gently rising land. This location affords opportunities for medium to long distance views to surrounding ridgeline locations. However, views toward wind turbines will be partially screened by a rising landform as well as mature scattered tree planting surrounding and beyond the dwelling.

The G6-3 wireframe model (Figure 17) illustrates that around 9 wind turbines would be visible from hub height (and below). Views will extend toward the closest wind turbine at around 2,249 metres from dwelling G6-3. The wireframe model also indicates that wind turbines would be visible within one 60° sector.

Further visual assessment has determined that dwelling G6-3 is unlikely to be significantly impacted by the wind farm and that dwelling G6-3 would be subject to a **low to medium visual effect** in accordance with the LVIA V3 March 2014.

Wireframe:

Figure 17, G6-3 wireframe information:

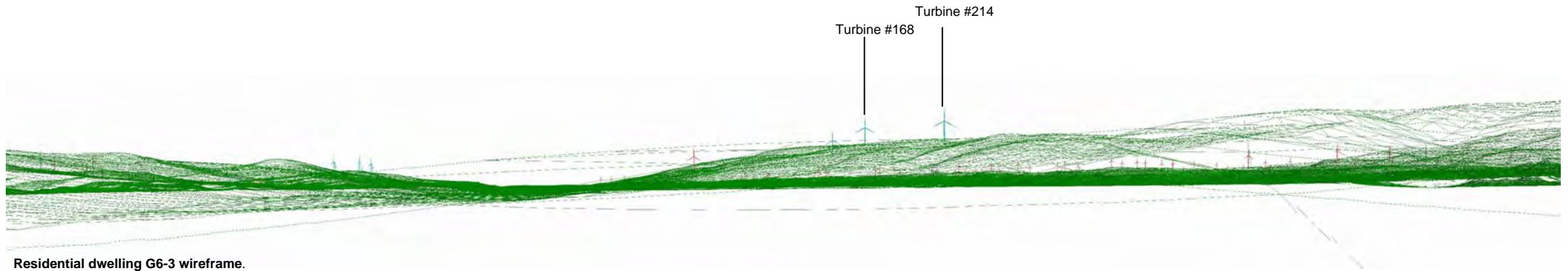
Start bearing: 177°, End bearing: 6°

Tips visible: 13

Hubs visible: 9

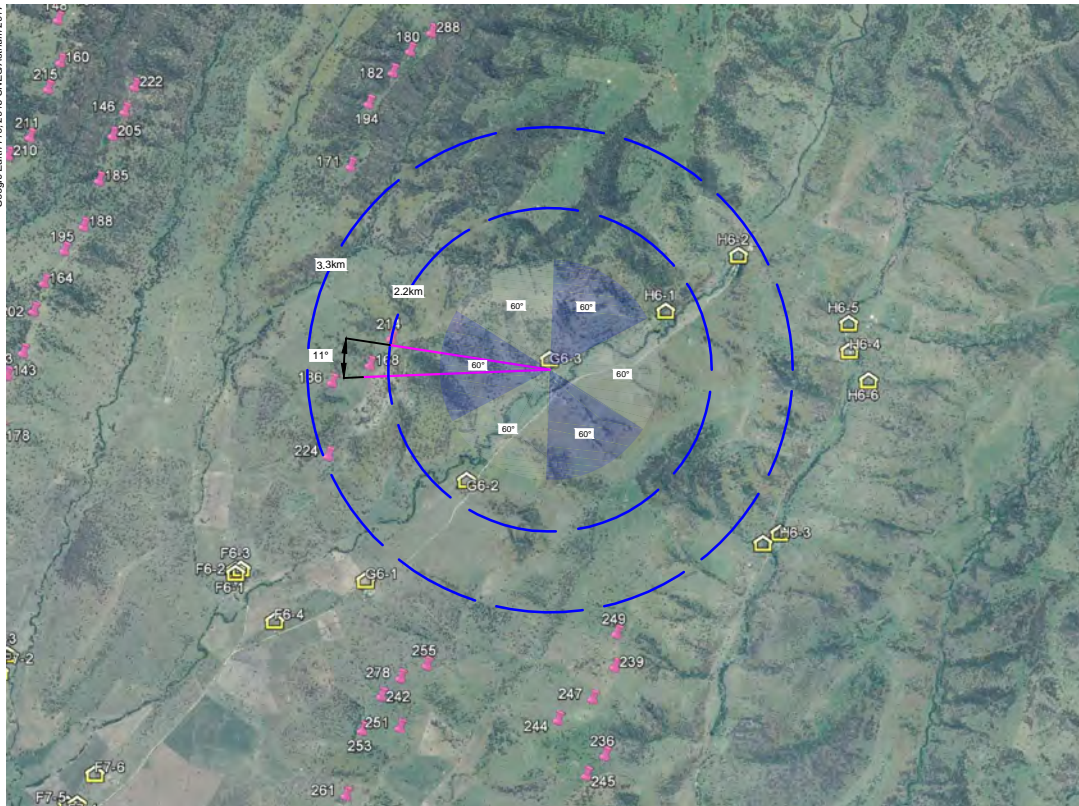
Closest turbine: Turbine #214 - 2,249m

Note: The number of visible wind turbine tips and hubs depicted in the wireframe model does not take into account the location and potential screening influence of existing tree cover, including planting proximate to, or beyond, residential dwellings.

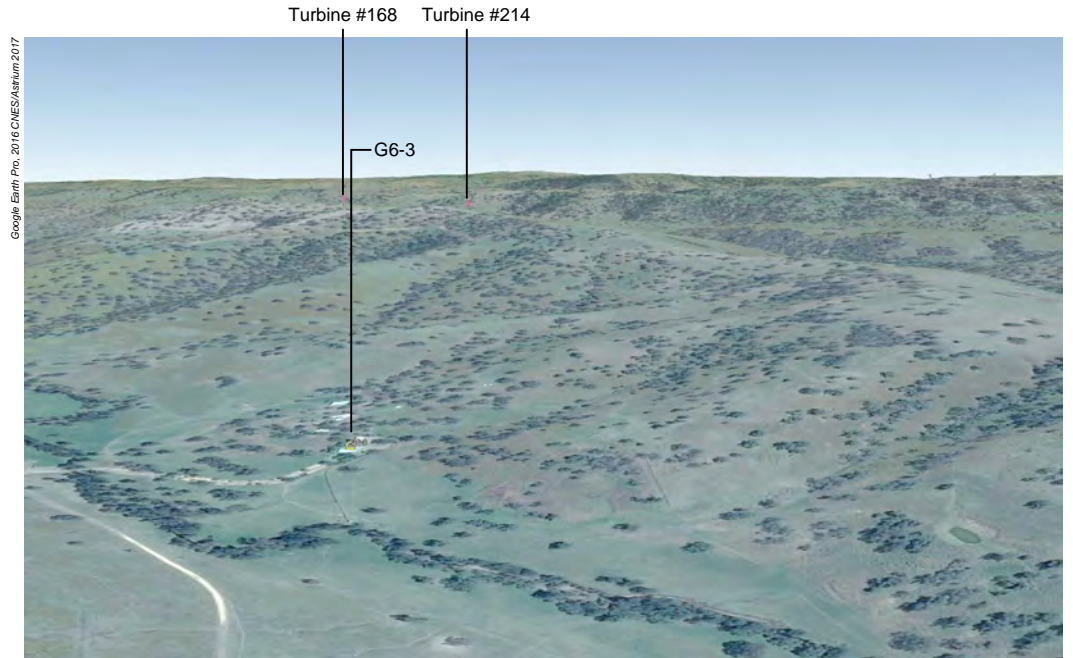
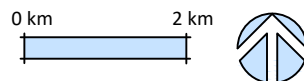


Residential dwelling G6-3 wireframe.

Approximate 11 degree field of view west from residential dwelling G6-3. Distance to closest wind turbine (#214) 2,249 metres. Visibility does not account for existing tree cover between dwelling and wind turbine, including existing tree planting within proximity to the residential dwelling. Blue wind turbines are visible or partially visible to tip of blade. Red wind turbines are screened by landform.



Residential dwelling G6-3 location plan



Residential dwelling G6-3 aerial oblique.

The aerial oblique illustrates typical landform characteristics and location of existing tree cover between G6-3 and surrounding wind turbines. The extent of wind turbines illustrated in the aerial oblique does not represent the potential visibility of wind turbines from the dwelling.

Note:

The landform illustrated in the green wireframe model occurs between the residential dwelling and the wind turbines. Sections of blue wind turbines will not be visible where indicated within or below the green wireframe model. Views will only extend toward sections of blue wind turbines where they occur above the green wireframe model.

Figure 17 Dwelling G6-3 Wireframe analysis

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Uninvolved dwelling H7-1 (St Antoine)

LVIA V3 March 2014

The LVIA V3 March 2014 included an assessment of dwelling H7-1.

The LVIA V3 March 2014 noted that for view location H7-1 *'The property has been purchased as an environmental offset and the residential dwelling is unoccupied. Views toward the closest wind turbines are screened by topography and vegetation surrounding the residential dwelling. Views toward the closest visible turbines occur from the east side of the property at a distance of around 2,900 m'*.

The LVIA V3 March 2014 determined that the H7-1 view location would be subject to a low level of visual effect.

Further visual assessment:

A supplementary assessment for dwelling H7-1 notes that the dwelling is located to the east of the wind farm project, on gently rising land. This location affords possible opportunities for medium to long distance views to surrounding ridgeline locations. However, views are generally constrained by slopes and ridgelines within the valley where the dwelling is located. Views toward wind turbines will be largely screened by a rising landform as well as mature scattered tree planting surrounding and beyond the dwelling.

The H7-1 wireframe model (Figure 18) illustrates that around 6 wind turbines would be visible from hub height (and below). Views will extend toward the closest wind turbine (tip of blade only) at around 1,795 metres from dwelling H7-1. The wireframe model also indicates that wind turbines would be visible within one 60° sector.

Further visual assessment has determined that dwelling H7-1 is unlikely to be significantly impacted by the wind farm and that dwelling H7-1 would be subject to a **low visual effect** in accordance with the LVIA V3 March 2014.

Wireframe:

Figure 18, H7-1 wireframe information:

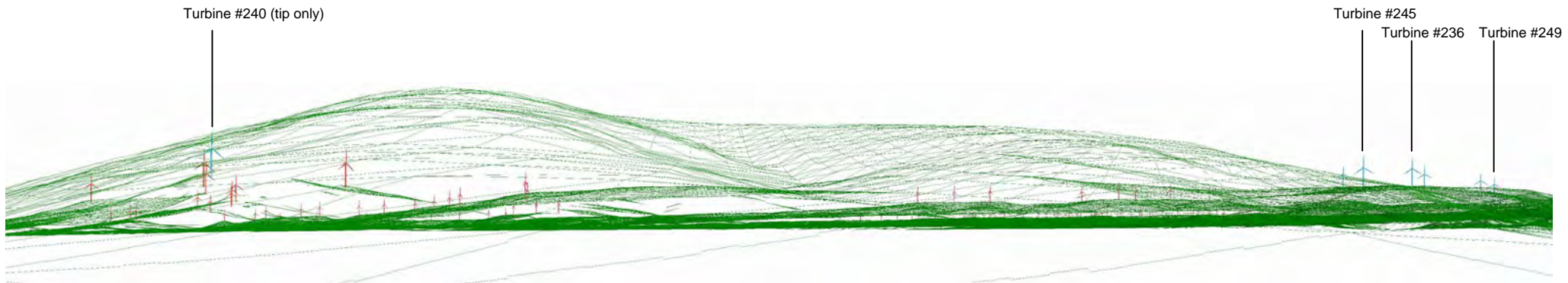
Start bearing: 200°, End bearing: 360°

Tips visible: 7

Hubs visible: 6

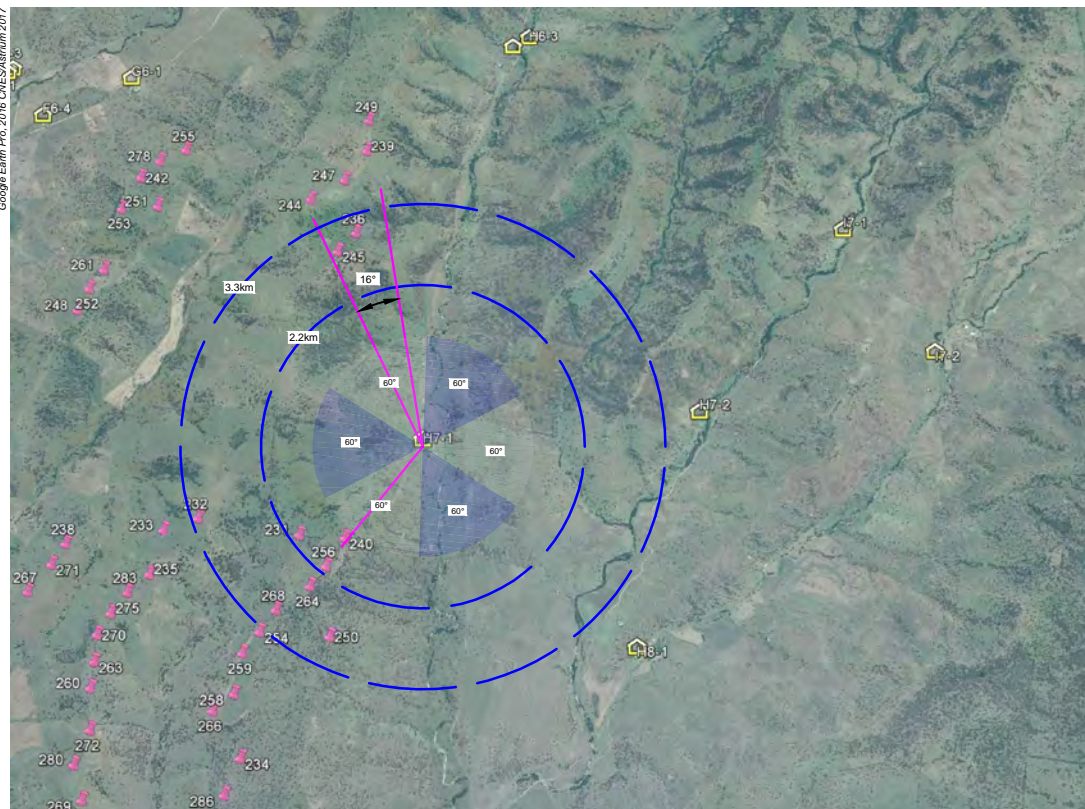
Closest turbine: Turbine #240 - 1,795m (tip of blade only)

Note: The number of visible wind turbine tips and hubs depicted in the wireframe model does not take into account the location and potential screening influence of existing tree cover, including planting proximate to, or beyond, residential dwellings.

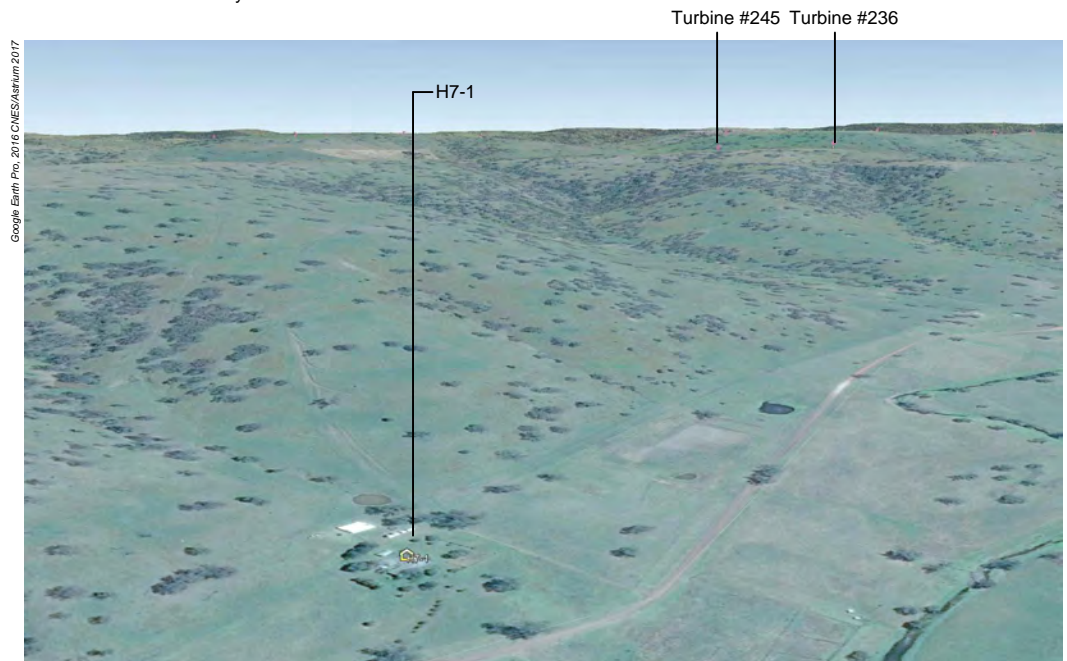
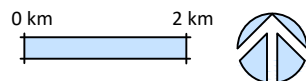


Residential dwelling H7-1 wireframe.

Approximate 16 degree field of view north from residential dwelling H7-1. Distance to closest wind turbine (#240) 1,795 metres. Visibility does not account for existing tree cover between dwelling and wind turbine, including existing tree planting within proximity to the residential dwelling. Blue wind turbines are visible or partially visible to tip of blade. Red wind turbines are screened by landform.



Residential dwelling H7-1 location plan



Residential dwelling H7-1 aerial oblique.

The aerial oblique illustrates typical landform characteristics and location of existing tree cover between H7-1 and surrounding wind turbines. The extent of wind turbines illustrated in the aerial oblique does not represent the potential visibility of wind turbines from the dwelling.

Note:

The landform illustrated in the green wireframe model occurs between the residential dwelling and the wind turbines. Sections of blue wind turbines will not be visible where indicated within or below the green wireframe model. Views will only extend toward sections of blue wind turbines where they occur above the green wireframe model.

Figure 18 Dwelling H7-1 Wireframe analysis

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Uninvolved dwelling 36 Charles Street, Coolah

LVIA V3 March 2014

The LVIA V3 March 2014 included an assessment of dwellings within Coolah. The LVIA V3 March 2014 noted that:

'Coolah is a small town to the west and approximately 6.5 km from the closest Liverpool Range wind turbine. The town is located to the west of the Coolaburragundy River valley and rises gently to the west toward a timbered undulating landform. There are various opportunities to gain long distance views toward a small number of wind turbines within the central west portion of the wind farm site; however, views from many of the streets within Coolah are screened and partially filtered by street tree planting and trees within residential properties.

The Liverpool Range wind farm is not expected to have a significant visual impact on residential dwellings and public view locations within the Cassilis and Coolah localities. This is primarily due to the screening influence of undulating landform, tree cover within the urban areas, as well as the distance between the wind farm and potential view locations within these rural localities'.

The LVIA V3 March 2014 determined that residential dwellings within the Coolah township would be subject to a low level of visual effect.

Further visual assessment:

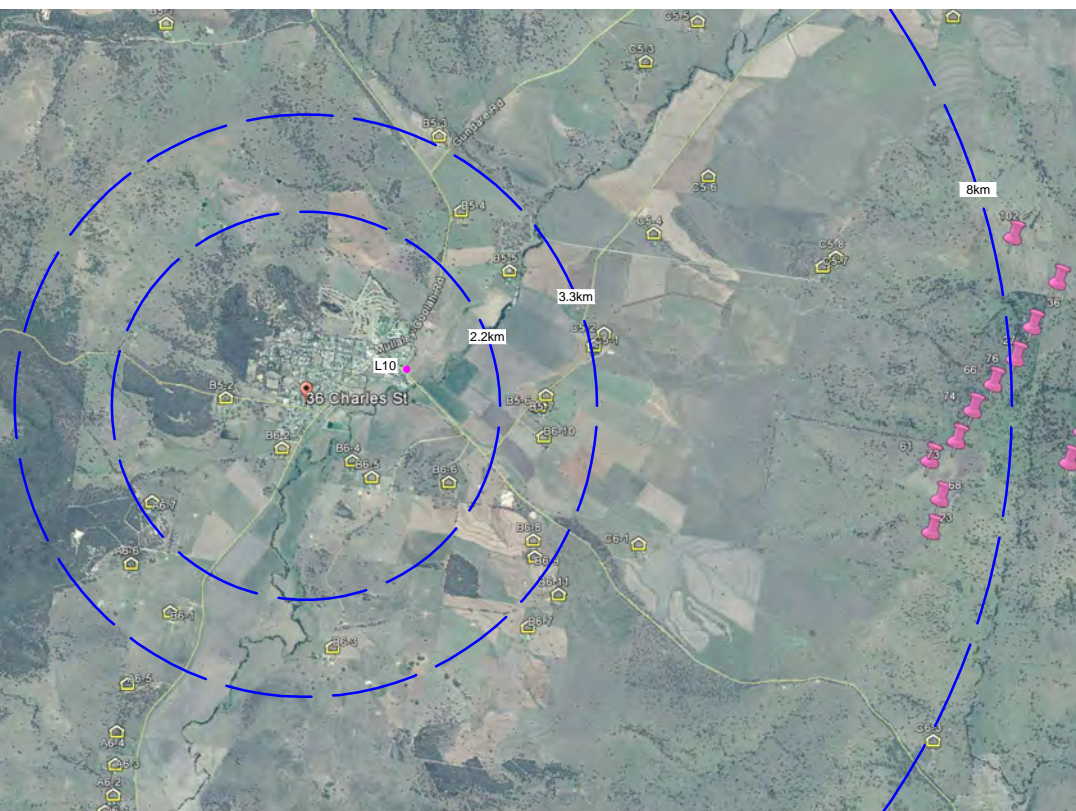
A supplementary assessment for the dwelling at 36 Charles Street notes that the dwelling is located to the south of Charles Street in an east to west orientation and is parallel to the Charles Street road corridor. Views from within the dwelling are generally screened by tree and shrub planting beyond the dwelling, with no windows directly aligned to the wind farm project. Views toward the nearest wind turbine (#61) from the garden at a distance around 7,200m, will also be partially obscured by tree and shrub planting. Where wind turbines are visible, the potential magnitude of visual effect will be minimised by the distance between the dwelling and the wind turbine locations.

Further visual assessment has determined that dwelling 36 Charles Street is unlikely to be significantly impacted by the wind farm and that dwelling 36 Charles Street would be subject to a **very low visual effect**.

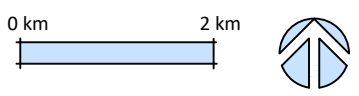
Figure 19 illustrates the locality of 36 Charles Street, the existing road corridor view toward the wind farm site adjacent to 36 Charles Street, and the photomontage from Coolah included in the LVIA V3 March 2014 report.



Ur a|a|a, A| &a|) SFC0 [[a|a|a|, A| @ * @FC0|] | a| a|a|a| & A| &| •• a|a|a| a| a|a| a|a|a|a|



36 Charles Street, Coolah location plan



36 Charles Street, Coolah
The photograph illustrates typical landform characteristics and location of existing tree cover between 36 Charles Street, Coolah and distant wind turbines.

Figure 19
36 Charles St, Coolah

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Main roads leading into Coolah

The LVIA V3 March 2014 noted that:

There are a small number of local roads that pass through the wind farm Project area including the:

- *Rotherwood Road;*
- *Turee Creek Road;*
- *Coolah Creek Road; and*
- *Gundaree Road.*

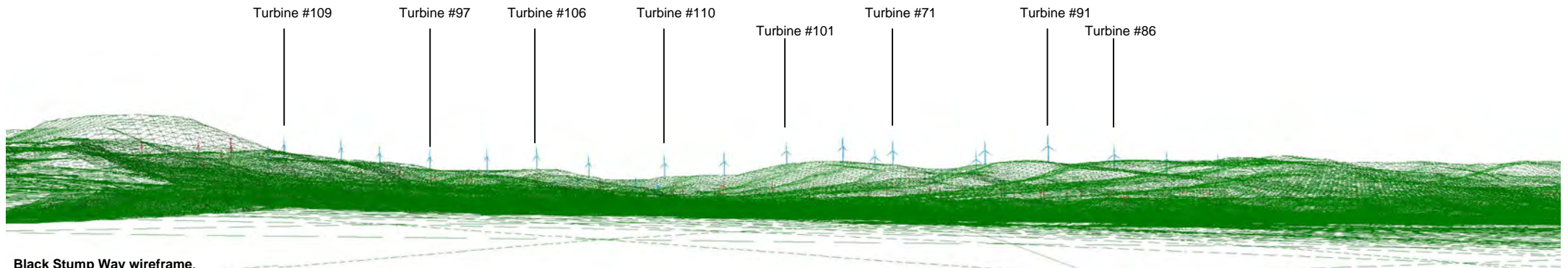
Views from vehicles travelling along local roads within the Project site will include a combination of very short to long distance direct and indirect views toward wind turbines. Whilst wind turbines may be visible whilst driving through the Project site, it is likely that the majority of journeys within the Project site will be those undertaken by residents involved with the Project.

Views from the Cassilis, Coolah and Vinegaroy Roads (between the Golden Highway, Cassilis and Coolah) will include direct and indirect views toward wind turbines in the south and central portions of the Project area up to a distance of 2km and 5 km from the wind turbines. The potential visibility of the Project will decrease slightly for vehicles travelling north west to south east.

Views from small portions of the road corridor between Coolah and Cassilis will be screened by landform and/or tree planting alongside or beyond the road corridor. The Liverpool Range wind farm will be unlikely to have a significant visual impact on motorists travelling along the Cassilis and Coolah roads.

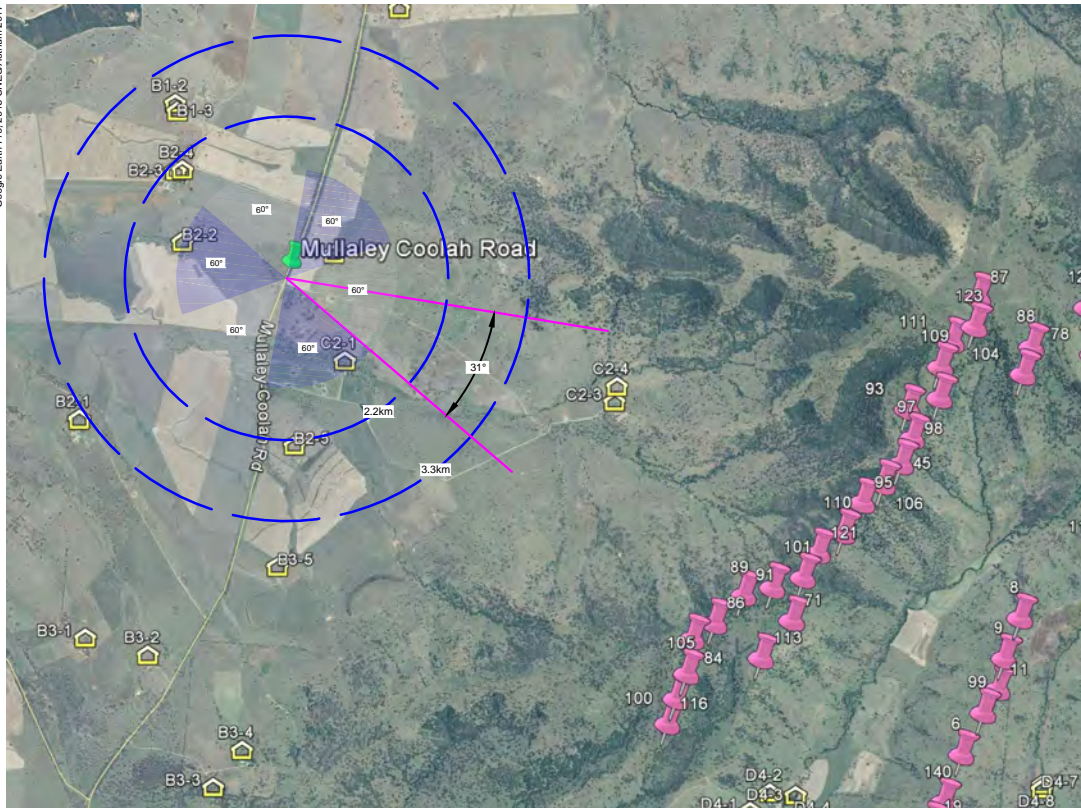
The Golden Highway extends east to west below the Project area between a distance of 5 km and 10 km from the closest wind turbine and provides a sequence of contained and open views from the road corridor. Distant and very short duration views toward wind turbines in the south portion of the Project area will occur from a section of the highway between Borambil and Cassilis, but will not tend to result in a significant visual impact.

Views toward the proposed wind farm site from the Leadville Road corridor (south of Coolah) will be partially screened by gently undulating landform rising above the Coolah Creek corridor which meanders alongside the road corridor. Whilst there is not a significant degree of vegetation alongside the road corridor, views will be largely indirect and transitory in nature. Indirect views from the Mullaley Coolah (Black Stump Way) road corridor (north of Coolah) toward the proposed wind farm site will be subject to a greater degree of partial screening through roadside tree planting. The potential for indirect views (at around 8,000m) from the road corridor are illustrated in **Figure 20**.

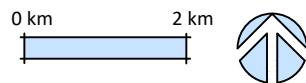


Black Stump Way wireframe.

Approximate 31 degree field of view east from Black Stump Way. Distance to closest wind turbine (#91) 7,900 metres. Visibility does not account for existing tree cover between dwelling and wind turbine, including existing tree planting within proximity to the residential dwelling. Blue wind turbines are visible or partially visible to tip of blade. Red wind turbines are screened by landform.



Black Stump Way location plan



Mullaley Coolah Road (Black Stump Way) aerial oblique.

The aerial oblique illustrates typical landform characteristics and location of existing tree cover between the Black Stump Way and surrounding wind turbines. The extent of wind turbines illustrated in the aerial oblique does not represent the potential visibility of wind turbines from the dwelling.

Note:

The landform illustrated in the green wireframe model occurs between the residential dwelling and the wind turbines. Sections of blue wind turbines will not be visible where indicated within or below the green wireframe model. Views will only extend toward sections of blue wind turbines where they occur above the green wireframe model.

Figure 20 Black Stump Way Wireframe analysis

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Summary

Table 2 presents a summary of the additional visual assessment prepared for the residential dwellings included in the LVIA March 2014 and nominated in the NSW Department of Planning and Environment submission.

Table 2

Dwelling ID	Name	Involved or uninvolved	Closest wind turbine	Number of 60° sectors with wind turbines	LVIA March 2014 visual impact	Additional visual assessment	Comments and potential mitigation
C2-3	Binnia Hills	Uninvolved	3,265m	2	Medium	Low to medium	Existing vegetation provides some screening toward proposed wind turbines from the dwelling and garden area. Additional landscape mitigation is unlikely to reduce the visual effect to any significant degree.
C4-1	Winooka	Uninvolved	3,631m	1	Medium	Medium	Existing scattered tree planting provides some degree of screening and filtering of views toward proposed wind turbines from the dwelling and garden area. Additional tree planting to the east of the dwelling would have potential to provide mitigation of more distant views toward wind turbines located on a ridgeline to the east of the dwelling. Additional

Table 2

Dwelling ID	Name	Involved or uninvolved	Closest wind turbine	Number of 60° sectors with wind turbines	LVIA March 2014 visual impact	Additional visual assessment	Comments and potential mitigation
							tree planting would have potential to result in a low to medium visual effect.
C4-5	Gundare	Uninvolved	3,500m	2	Medium	Medium	Additional tree planting to the north and east of the dwelling would have potential to provide mitigation of views toward wind turbines located on ridgelines to the north east and east of the dwelling. Additional tree planting will have potential to result in a low to medium visual effect.
C4-8		Uninvolved	3,200m	2	Medium	Medium to high	Additional tree planting to the north and east of the dwelling would have potential to provide mitigation of views toward wind turbines located on ridgelines to the north and east of the dwelling. Additional tree planting will have potential to result in a medium visual effect.

Table 2

Dwelling ID	Name	Involved or uninvolved	Closest wind turbine	Number of 60° sectors with wind turbines	LVIA March 2014 visual impact	Additional visual assessment	Comments and potential mitigation
C4-9	Leeton	Uninvolved	3,582m	2	Medium	Medium	Existing scattered tree planting and adjoining farm building provide some degree of screening and filtering of views toward proposed wind turbines from the dwelling. Additional tree planting to the east of the dwelling would have potential to provide mitigation of more distant views toward wind turbines located on a ridgeline to the east of the dwelling. Additional tree planting would have potential to result in a low to medium visual effect.
C5-6	Kurralah	Uninvolved	3,561m	1	Medium	Medium	Existing scattered tree planting and adjoining farm building provide some degree of screening and filtering of views toward proposed wind turbines from the dwelling. Additional tree planting to the east of the dwelling would have potential to provide mitigation of views toward wind turbines located on ridgelines to the north

Table 2

Dwelling ID	Name	Involved or uninvolved	Closest wind turbine	Number of 60° sectors with wind turbines	LVIA March 2014 visual impact	Additional visual assessment	Comments and potential mitigation
							and east of the dwelling. Additional tree planting will have potential to result in a low to medium visual effect.
C5-9	Willania	Uninvolved	3,229m	2	Medium	Medium	Existing scattered tree planting provides some degree of screening and filtering of views toward proposed wind turbines from the dwelling. Some limited additional tree planting to reinforce existing tree planting would have potential to mitigate views to the north and south east of the dwelling.
C6-1	Sunnyside	Involved	-	-	-	-	-
C6-3	Collie Blue	Uninvolved	2,283m	2	Medium	Medium	Existing scattered tree planting provides some degree of screening and filtering of views toward proposed wind turbines from the dwelling and garden area. Additional tree planting to the north east and east of the

Table 2

Dwelling ID	Name	Involved or uninvolved	Closest wind turbine	Number of 60° sectors with wind turbines	LVIA March 2014 visual impact	Additional visual assessment	Comments and potential mitigation
							dwelling would have potential to provide mitigation of more distant views toward wind turbines located on a ridgeline to the east of the dwelling. Additional tree planting would have potential to result in a low to medium visual effect.
C6-4	Brooksby	Involved	-	-	-	-	-
C7-1	Wilandra	Involved	-	-	-	-	-
D4-9	Gynawah	Involved	2,200m		Medium to high	Medium to high	Involved landowner, no proposed mitigation to reduce potential visual impact
D7-2		Involved	4,280m	2	Medium	Medium	-
D7-3	Tallue	Uninvolved	-	-	-	-	No proposed mitigation to reduce potential visual impact

Table 2

Dwelling ID	Name	Involved or uninvolved	Closest wind turbine	Number of 60° sectors with wind turbines	LVIA March 2014 visual impact	Additional visual assessment	Comments and potential mitigation
D7-4	Cooinda	Uninvolved	2,926m	1	Medium	Medium	Existing scattered tree planting provides some degree of screening and filtering of views toward proposed wind turbines from the dwelling and garden area. Additional tree planting to the east of the dwelling would have potential to provide mitigation of more distant views toward wind turbines located on a ridgeline to the north east and east of the dwelling. Additional tree planting would have potential to result in a low to medium visual effect.
E9-4	Rangeview	Uninvolved	4,000m	1	Medium	Low to medium	Landscape mitigation is considered unlikely to provide any additional or significant potential screening for this dwelling.
F8-1	Tangaratta	Involved	-	-	-	-	-

Table 2

Dwelling ID	Name	Involved or uninvolved	Closest wind turbine	Number of 60° sectors with wind turbines	LVIA March 2014 visual impact	Additional visual assessment	Comments and potential mitigation
F9-1	Culbara	Uninvolved	2,337m	1	Medium	Low to medium	Landscape mitigation is considered unlikely to provide any additional or significant potential screening for this dwelling.
G6-2	Glenwood	Uninvolved	1,974m	1	Low to medium	Low to medium	Landscape mitigation is considered unlikely to provide any additional or significant potential screening for this dwelling.
G6-3	Ellaroy	Uninvolved	2,249m	1	Low to medium	Low to medium	Landscape mitigation is considered unlikely to provide any additional or significant potential screening for this dwelling.
H6-3		Uninvolved	-	-	-	-	-
H7-1	St Antoine	Uninvolved	1,795m	1	Low	Low	Landscape mitigation is considered unlikely to provide any additional or significant potential screening for this dwelling.

Amended wind turbine dimensions

The LVIA March 2014 included photomontages which illustrated the proposed wind turbines at a 157-metre tip height. Subsequent to the preparation of the LVIA, the proposed wind turbine design parameters were amended to include a wind turbine with a 165-metre tip height. The 165-metre tip height have been illustrated in the wind turbines presented in the wireframe models included in this Addendum Report.

The LVIA March 2014, and the amended wind turbine are compared and illustrated in **Figure 21** and described in **Table 3**.

Table 3: LVIA March 2014 and amended wind turbine dimensions

	Hub height	Rotor diameter	Tip height
LVIA March 2014 wind turbine	101	112 m	157 m
Amended wind turbine	101	130 m	165 m
Difference	0	+18 m	9 m
Percentage difference	0%	+14%	+5%

Given the relatively small increase in proposed wind turbine tip height (around 5%), the increase in height is not considered to be of a magnitude that would significantly increase visual effects of the wind turbines presented in the LVIA March 2014 photomontages.

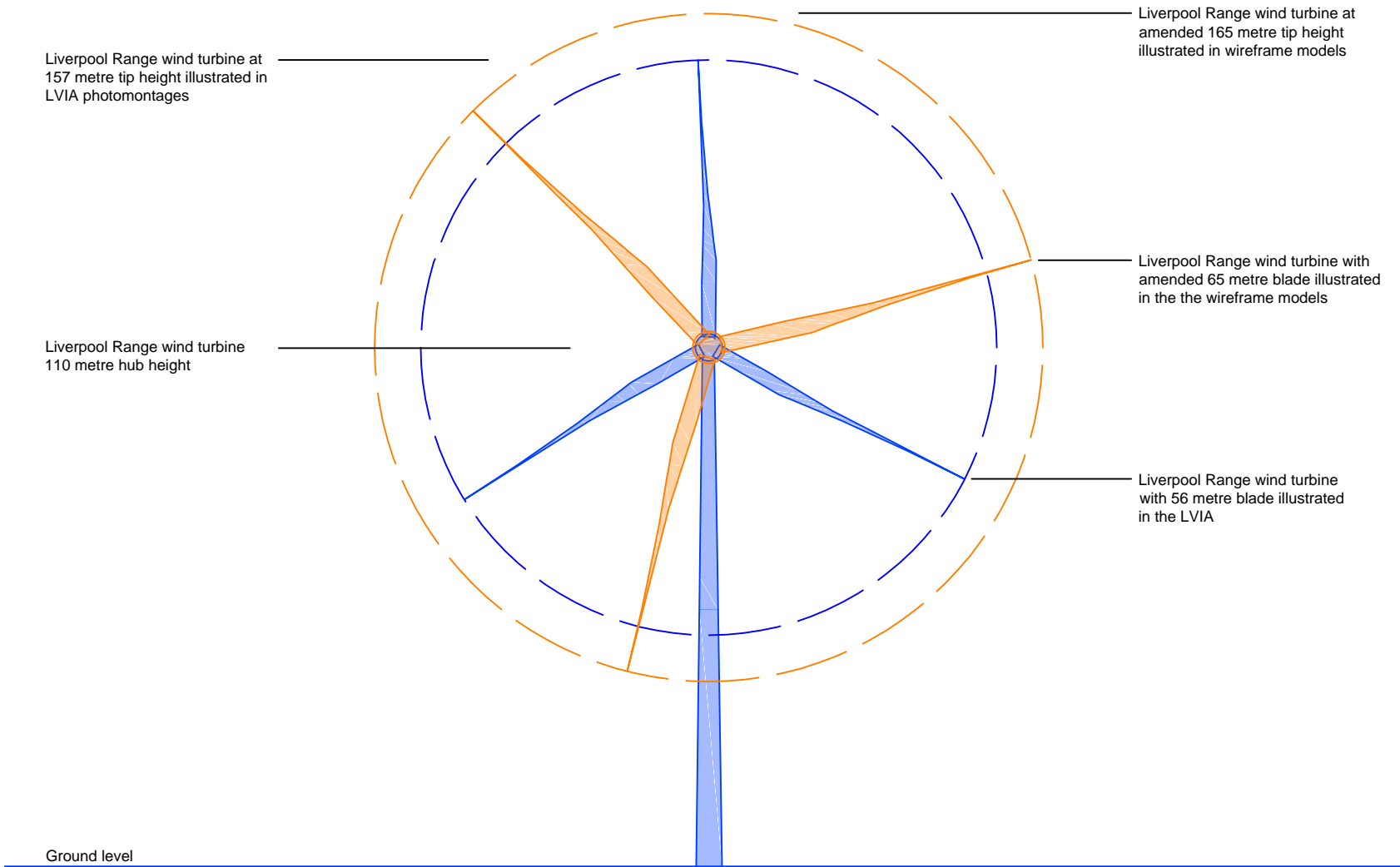


Figure 21
Liverpool Range wind turbine
157m and 165m tip height
comparison

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