

CROOKWELL 2 WIND FARM



On-site landscaping plan

Prepared for:

CROOKWELL DEVELOPMENT PTY LTD

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DOCUMENT CONTROL

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1.1 Introduction

Green Bean Design Pty Ltd (GBD) has been commissioned by Crookwell Development Pty Ltd (CDPL) to prepare an On-site Landscaping Plan (OLP) for the approved and constructed Crookwell 2 Wind Farm (C2WF). This OLP has been prepared in response to, and addresses, the Crookwell 2 Wind Farm Project Approval, Conditions of Approval (CoA) and specifically Landscaping Requirements Condition C36 of the CoA.

The approval process for the C2WF requires preparation of an OLP to *'address the visual impacts of the development as far as is reasonable and feasible including the turbines, site access roads, the substation, and the control and facilities building'*.

This OLP has been prepared with regard to the Roads and Maritime Services publication 'Landscape guideline' April 2008 as relevant to the on-site landscape works.

1.2 On-site landscaping plan scope of works

In accordance with Condition of Approval, the on-site landscaping plan scope includes:

- identification of relevant Condition of Approval
- description of the Condition of Approval inferred objectives
- record of consultation undertaken by CDPL and GBD
- identification of plant species and planting locations to address the Condition of Approval
- preparation of planting plans
- provision of a maintenance programme for the landscape works.

1.3 Condition of Approval - Condition C36

Condition C36 is set out in full below.

Prior to the commencement of operation of the development, the Applicant must prepare an Onsite Landscaping Plan. The On-Site Landscaping Plan is to address the visual impacts of the development as far as is reasonable and feasible including the turbines, site access roads, the substation, and the control and facilities building. The On-Site Landscaping Plan is to include, but not be limited to:

(a) identification of locations for planting and landscaping;

(b) identification of species to be planted; and

(c) details of the maintenance program for on-site landscaping associated with the development.

The On-Site Landscaping Plan is to be implemented within six months of commencement of operation.

1.4 On-site landscaping plan consultation

CDPL and GBD have carried out consultation with associated landowners with regard to planting locations and plant species proposed for screen planting. Public authorities have not been contacted with regard to the on-site landscape works which would be wholly located on private land.

1.5 On-site landscape works

Site inspections have identified limited opportunity for on-site landscaping to provide feasible screening toward some elements of wind farm infrastructure as some elements, such as access roads, will be screened by existing

landform and/or tree cover within the wind farm site boundary. The site inspections also determined that on-site landscape works are also unlikely to provide any reasonable or feasible mitigation to wind turbine visibility due to their scale and relative position to external view locations. Views from external view locations, including residential dwellings will have greater potential to be screened from the viewpoint in accordance with Condition 38 of the Conditions of Approval. **Table 1** outlines key wind farm infrastructure and built elements together with a consideration of on-site landscape planting and its potential efficacy to screen views from view locations surrounding the wind farm site.

Table 1 – Wind Farm infrastructure and screening feasibility

Wind Farm infrastructure key elements	On site screening feasibility	Notes
Wind turbine	None	<p>Site inspections have determined that on site landscape works (other than works associated with the Crookwell Road Landscape Management Plan, Condition 37) will offer no feasible or reasonable levels of visual impact mitigation where the approved wind turbines are visible on slopes and hilltops from areas beyond the wind farm site.</p> <p>On site landscape works including grass seeding will occur on constructed elements such as embankments or cuttings around the wind turbine hardstand areas as part of the site rehabilitation works.</p>
Wind monitoring tower	None	Site inspections have determined that on site landscape works will offer no feasible or reasonable levels of visual impact mitigation where wind monitoring towers are visible on slopes and ridgeline areas.
Access roads	None	Access road within the wind farm site are largely screened by undulating landform surrounding the site. On-site landscape works including grass seeding have been carried out on constructed embankments and cuttings as part of the site rehabilitation works.
Substation	Yes	Site inspections have confirmed that the substation is visible from view locations surrounding the wind farm site boundary, including the Pejar Dam picnic area, short sections of Crookwell Road on the Pejar Dam wall and the Woodhouselee Road. On-site landscape works will provide some degree of visual mitigation and are detailed further in this OLP.
Operations building/control room	Yes	The operations building/control room is located within the substation precinct and will be screened through landscape works to mitigate views toward the substation.

1.6 Planting schedule

A list of native trees and shrub species have been compiled for the purpose of screening the substation. Nominated native tree planting has been sourced from the NSW Department of Environment and Heritage, Bioregions of NSW, South Eastern Highlands Bioregion:

<https://www.environment.nsw.gov.au/resources/nature/southEasternHighlands.pdf>

Table 2 – Planting schedule

Scientific name	Common name	Mature height (m)	Pot size	Plant spacing	Quantity
TREES					
<i>Eucalyptus dives</i>	Broad-leaved Peppermint	up to 20	Tube	7m cts	51
<i>E. melliodora</i>	Yellow Box	up to 20	Tube	7m cts	12
<i>E. blakelyi</i>	Blakely's Red Gum	up to 25	Tube	7m cts	51
<i>E. albens</i>	White Box	up to 25	Tube	7m cts	12
<i>Populus x canadensis</i> 'Evergreen 65-1' **	Canadian Poplar	Up to 20	200mm	2.5m cts	193 (237 with planting area 7)
SHRUBS					
<i>Acacia falciformis</i>	Broad leaved hickory	up to 8	Tube	As nominated on figures	124
<i>A. implexa</i>	Hickory Wattle	up to 12	Tube	As nominated on figures	32
<i>Bursaria spinosa</i>	Native Blackthorn	up to 5	Tube	As nominated on figures	124

** Non-native plant species

Refer to **Figures 1** and **2** for the on-site landscaping plans illustrating planting areas 1 to 8.

It is noted that Planting area 6 illustrated on **Figure 1** is located between the existing TransGrid 330kV transmission line and the C2WF substation asset protection zone. This area also contains an electrical cable trench. Planting area 6 is subject to further detailed site verification and approval by TransGrid. If Planting area 6 is not considered feasible due to various constraints then Planting area 7 will be installed as an alternative.

1.7 Timing and implementation for landscape works

The implementation of landscape works should generally not occur in areas that are likely to be subject to future earthworks or construction activities. However, site landscape preparation work should commence as soon as practically possible after construction works have been completed and integrated with site rehabilitation works that will stabilise disturbed areas and commence revegetation. Ideally landscape planting should occur in late autumn and/or winter months.

To facilitate successful plant establishment:

- groundwork and site preparation should not be carried out whilst site conditions are subject to water logging or excessive soil moisture
- plant installation should not occur during cold periods or at times when frost is likely to occur before or following planting
- plant installation should not occur during or prior to expected periods of extreme heat.

The appointed landscape contractor and/or landowner will undertake the following tasks, including but not limited to:

- conduct site inspection/verification to located all planting areas
- order plant stock and associated materials
- isolate livestock from planting areas and deep rip 3 metre wide planting areas to 500mm depth
- mark out fencing locations for landowner approval and install. Provide maintenance access points to planting areas as necessary
- undertake weed/grass spraying as necessary to planting areas
- install planting in accordance with drawings
- plants to be installed with staking and standard tree guards as necessary and
- all plants to be watered on installation with ongoing watering as necessary to achieve plant establishment within the maintenance period.

1.8 Inspection of landscape works

An inspection program for all planting areas shall be implemented. Site inspections shall be carried out at 3 monthly intervals for the duration of the 24-month maintenance period. The site inspections will determine and verify the establishment and growth of plantings, as well as the state of associated fencing and/or plant protection measures. A number of typical locations shall be identified to photograph the landscape works at each 3 monthly site inspection. These locations shall be re-photographed during each site inspection and provided to the Department of Planning and Environment together with a summary report on the establishment and growth of planting at 6 monthly intervals during the maintenance period.

1.9 Maintenance

All areas subject to landscape works shall be inspected to identify any required actions during the maintenance period. **Table 3** outlines the key elements to be inspected and tasks to be undertaken during the maintenance period.

Table 3 – Landscape maintenance tasks

Landscape element	Maintenance action
Planting	<p>Inspection:</p> <p>Check for dead or missing plants</p> <p>Check for pest damage</p> <p>Action:</p> <p>Replace missing or dead plants with the same species and size as originally installed</p> <p>Identify pest (insect/vertebrate) and action accordingly</p>
Weeds	<p>Inspection:</p> <p>Check planting area for weed growth and or infestation</p> <p>Action:</p> <p>Undertake weed control as necessary to maintain all planted areas weed free</p>
Fences	<p>Inspection:</p> <p>Check for any damage</p> <p>Action:</p> <p>Make repairs as necessary</p>
Stakes and tree guards	<p>Inspection:</p> <p>Check for any damage and/or missing stake or guards</p> <p>Action:</p> <p>Make repairs and/or replace as necessary</p> <p>Remove stakes and ties once plants are considered self supporting</p>

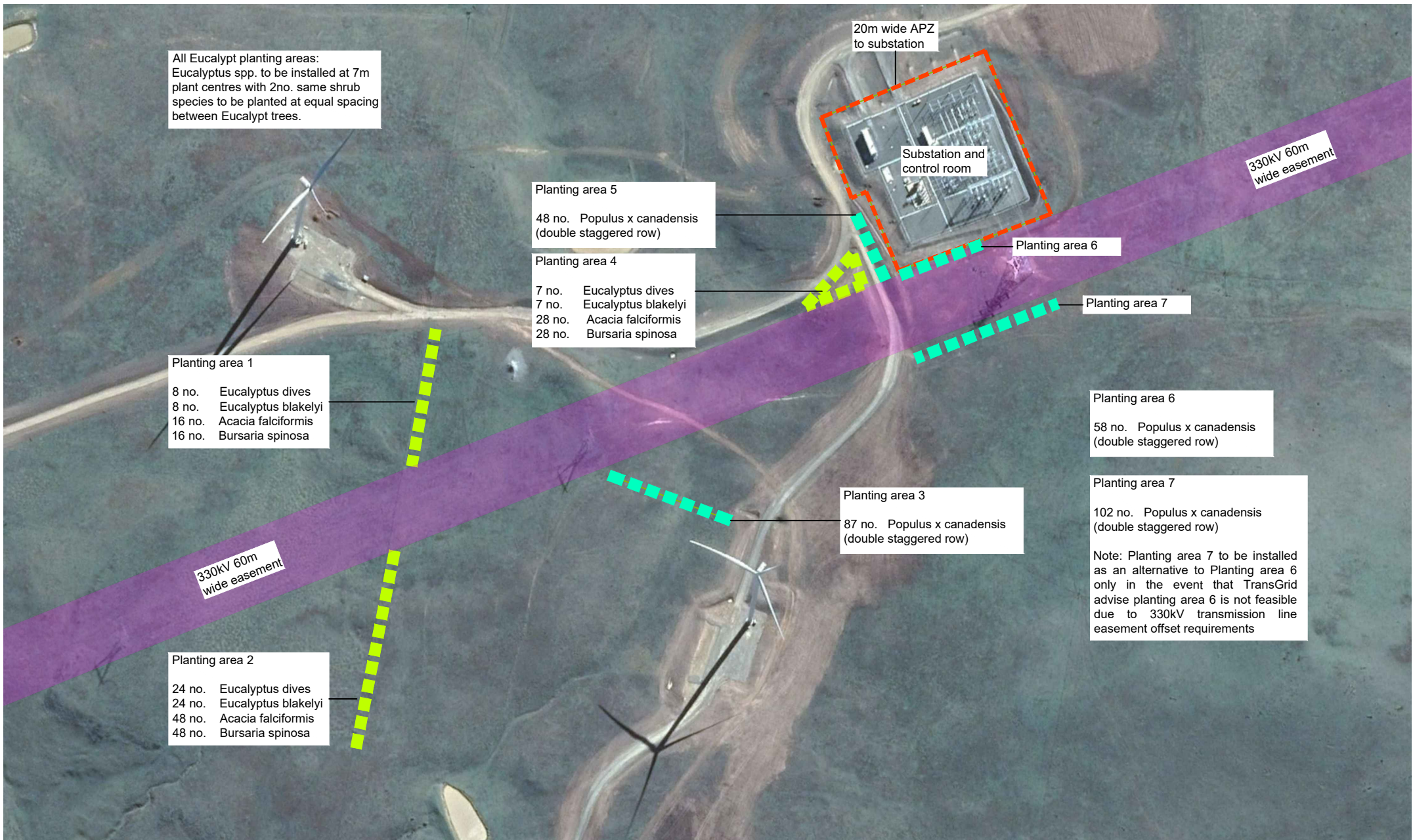
2.0 Outcome based plant establishment

At the completion of the 24-month maintenance period a final site inspection shall be carried out to review and verify successful plant establishment. Successful plant establishment will be determined by not less than 90% of plants being recorded as established across each planting area 1 to 8 (incorporating either planting area 6 or 7).

Where planting areas contain less than 90% of established plants the following actions will be undertaken:

- All missing or dead plants shall be replaced with the same species and sizes as originally installed.
- Where plants have visibly not achieved a rate of growth consistent with the majority of same plant species, these plants shall be removed and replaced with the same plant species and size as originally installed.
- Where areas of planting are considered to have been impacted by conditions beyond the control of CDPL, then measures shall be discussed with DPE to resolve any residual impact and/or seek alternative approaches to achieve the requirements of the relevant CoA.

Appendix A – Landscape Plans Sheets 1 and 2



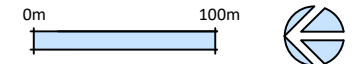
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LEGEND

- Planting area of mixed tree and shrub species in double staggered row
- Planting area of *Populus x canadensis* only in double staggered row

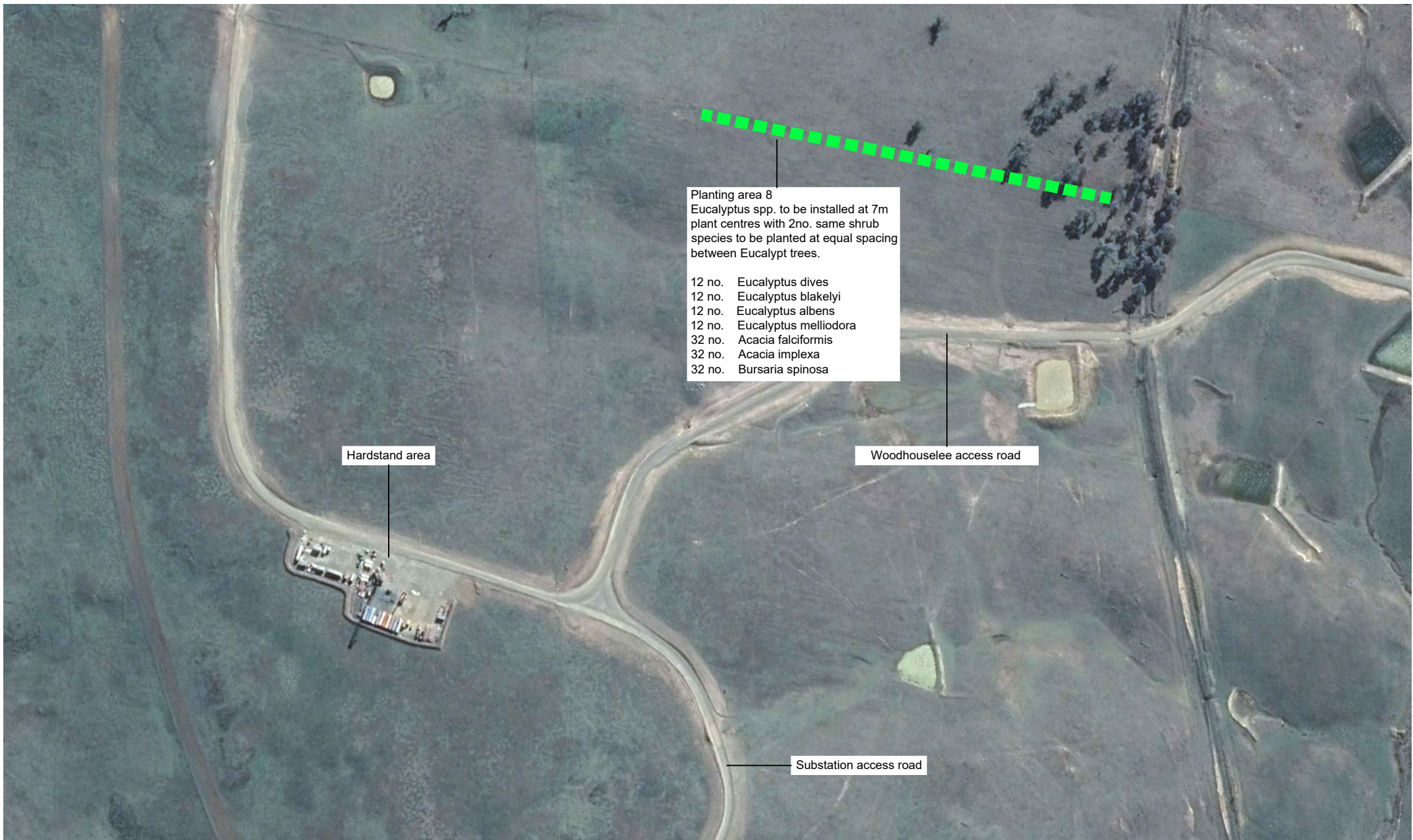
The final location of all planting shall be verified on site and confirmed with TransGrid with regard to the 330kV transmission line easement offset requirements.

Mixed planting to be installed in random groups of 3 to 5 number of same plant species. Adjust planting locations on site as necessary to beyond drip line of existing trees.




Crookwell 2 Wind Farm on-site landscape plan

Figure 1 Landscape Plan Sheet 1
C2WF on-site landscape plan

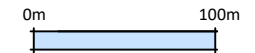


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LEGEND

 3 metre wide planting area of mixed tree and shrub species in double staggered row

Mixed planting to be installed in random groups of 3 to 5 number of same plant species. Adjust planting locations on site as necessary to beyond drip line of existing trees.



Crookwell 2 Wind Farm on-site landscape plan

Figure 2 Landscape Plan Sheet 2
 C2WF on-site landscape plan