



UNION FENOSA WIND AUSTRALIA

Crookwell 3 Wind Farm
Chapter 14

FLORA AND FAUNA IMPACTS

14 Flora and Fauna

14.1 Introduction

An assessment of the potential flora and fauna impacts of the proposed Crookwell 3 Wind Farm was undertaken by Anderson Environmental Consultants Pty Ltd. The Ecological Assessment report can be found at **Appendix 8**.

The assessment was undertaken to address the EARs and determine the presence or potential presence within the project site of any threatened species, populations or endangered ecological communities as listed under the *Threatened Species Conservation Act 1995* (NSW) (TSC Act) and the *Environment Protection and Biodiversity Conservation Act 1999* (Cth) (EPBC Act).

As a requirement of the EARs, additional targeted threatened species surveys were conducted in the spring/summer seasons from October 2010 to mid-January 2011.

The ecological assessment was also updated in June 2012 to reflect the *Draft NSW Wind Farm Planning Guidelines* (December 2011).

Although no vegetation offset is required for the clearing required for the project, an offset is proposed by way of two Property Vegetation Plan agreements with the Hawkesbury Nepean Catchment Management Authority to be entered into if the project is approved.

14.2 Methodology

A literature review was carried out by Anderson Environmental in order to assist in the identification of threatened flora and fauna species and endangered ecological communities listed under the TSC Act and the EPBC Act with potential to occur in the area of the site. This literature review was based on database searches of:

- NPWS *Wildlife Atlas for the Goulburn Mulwaree Local Government Area*;
- EPBC online Protected Matters database search tool for Upper Lachlan Local Government Area; and
- NPWS (2000) *Forest Ecosystem Classification and Mapping for the Southern CRA region, Volumes I and II*.

Initial field surveys were then conducted based on the following methodology;

- *Initial site familiarisation to determine potential ecological issues in relation to turbine cluster sitings, access tracks and access roads.*
- *Field surveys to identify vegetation types, condition and potential level of impacts including targeted threatened plant surveys.*
- *Mapping of vegetation community units on aerial photographs. This was undertaken concurrently with the field surveys to identify the vegetation types.*
- *Field surveys to identify habitat types, condition and potential level of impacts.*
- *Mapping of habitat types on aerial photographs. This was undertaken concurrently with the field surveys to identify the vegetation types.*

These initial field investigations were undertaken from late February 2010 to early June 2010. A total of 6 days was spent surveying the site (excluding targeted surveys).

As a requirement of the EARs, additional extensive targeted threatened species surveys were conducted in the spring/summer seasons from October 2010 to mid-January 2011. Details of these targeted surveys and the time spent carrying them out is set out in Appendix 5 of the ecological impact assessment at **Appendix 8**.

14.3 Proposed vegetation removal and offsets

Some vegetation removal is an unavoidable consequence of the project. The areas for the proposed vegetation removal are shown in **Figure 47 – Vegetation Removal**

Plan Crookwell 3 East Area 1, Figure 48 – Vegetation Removal Plan Crookwell 3 East Area 2 and Figure 49 – Vegetation Removal Plan Crookwell 3 South. The approximate areas of vegetation required to be removed are as follows;

- Turbine A12 (314 sqm for each turbine location) with the addition of approximately 2,000 sqm for its access track, and up to 2,500 sqm for the temporary crane hard stand area (total removal of vegetation being 4,814 sqm). The removal of vegetation is within remnant E and illustrated in **Figure 47**.
- Turbines A18 and A19 (314 sqm for each turbine location) with the addition of approximately 4,000 sqm for their access tracks, and up to 5,000 sqm for the temporary crane hard stand areas (total removal of vegetation being 9,628 sqm). The removal of vegetation is within remnant B and illustrated in **Figure 48**.
- Greywood Siding Road proposed access would remove approximately 5,000 sqm of vegetation combined for the whole of its route.
- Wollondilly access point and the transmission line interconnection around Pejar Dam would remove approximately 4,000 sqm of vegetation in total. The access point is located within remnant H and the transmission line is located within remnant I, as illustrated in **Figure 49**.

Therefore it is estimated that approximately 23,442 sqm or 2.34 hectares of native vegetation in total will be required to be removed from the Western Tablelands Dry Forest vegetation community for this project. For the details of the dominant species within this vegetation community, refer to Section 2.4.2.3 Remnant Native Vegetation in Appendix 8 of the report.

There is an existing Property Vegetation Plan (PVP) in place on the property of 'Hillview Park' for an area of approximately 171 hectares which includes the areas where turbines A18 and A19 are proposed to be located. This area is described as 'Remnant B' in the report. This remnant is the subject of an existing Property Vegetation Plan agreement entered into by the landholder dated 17 December 2002 (2002 PVP). The 2002 PVP will expire on 17 December 2013. No works are proposed to be carried out in remnant B during the term of the 2002 PVP. Further, it is considered that the impacts from the placing of the two turbines within this remnant would be low.

It is currently proposed that the clearing required for the project, including in relation to Remnant B, will be offset by two new PVPs to be entered into with Hawkesbury Nepean Catchment Management Authority (HNCMA) if the project is approved. It is proposed that these PVPs would provide an offset of approximately 60 hectares for extent of clearing required for the project, being:

- 15 ha in perpetuity; and
- an additional 45 ha for the life of the wind farm.

The proponent would provide sufficient funds each year for feral animal control and management of these two agreement areas. HNCMA have provided their in-principal support for this proposed voluntary offset strategy.

14.4 Results

The vegetation across the site is primarily represented by cleared grazing paddock, of which the majority is highly disturbed. Most of the more fertile areas of the site have been extensively cleared for grazing (sheep and cattle grazing). Parts of these cleared areas (primarily at the lower altitudes) *"would have once represented the Endangered Ecological community of White Box-Yellow Box-Blakelys Red Gum Grassy Woodland and Derived Native Grassland however these areas are now largely cleared and pasture improved"*.

The wind turbines are proposed to be located primarily on cleared grazing lands, as are the access roads and other associated infrastructure.

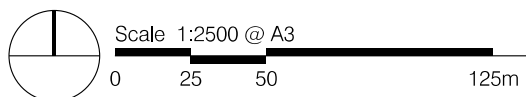


FIGURE 47 - VEGETATION REMOVAL PLAN - CROOKWELL EAST AREA 1

| LEGEND | | | |
|--------|----------------------|--|-------------------|
| | Turbine Footing Area | | Tree Removal Zone |
| | Hardstand Area | | Access Tracks |

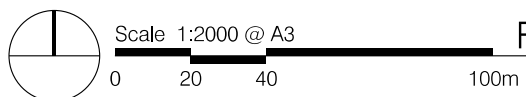
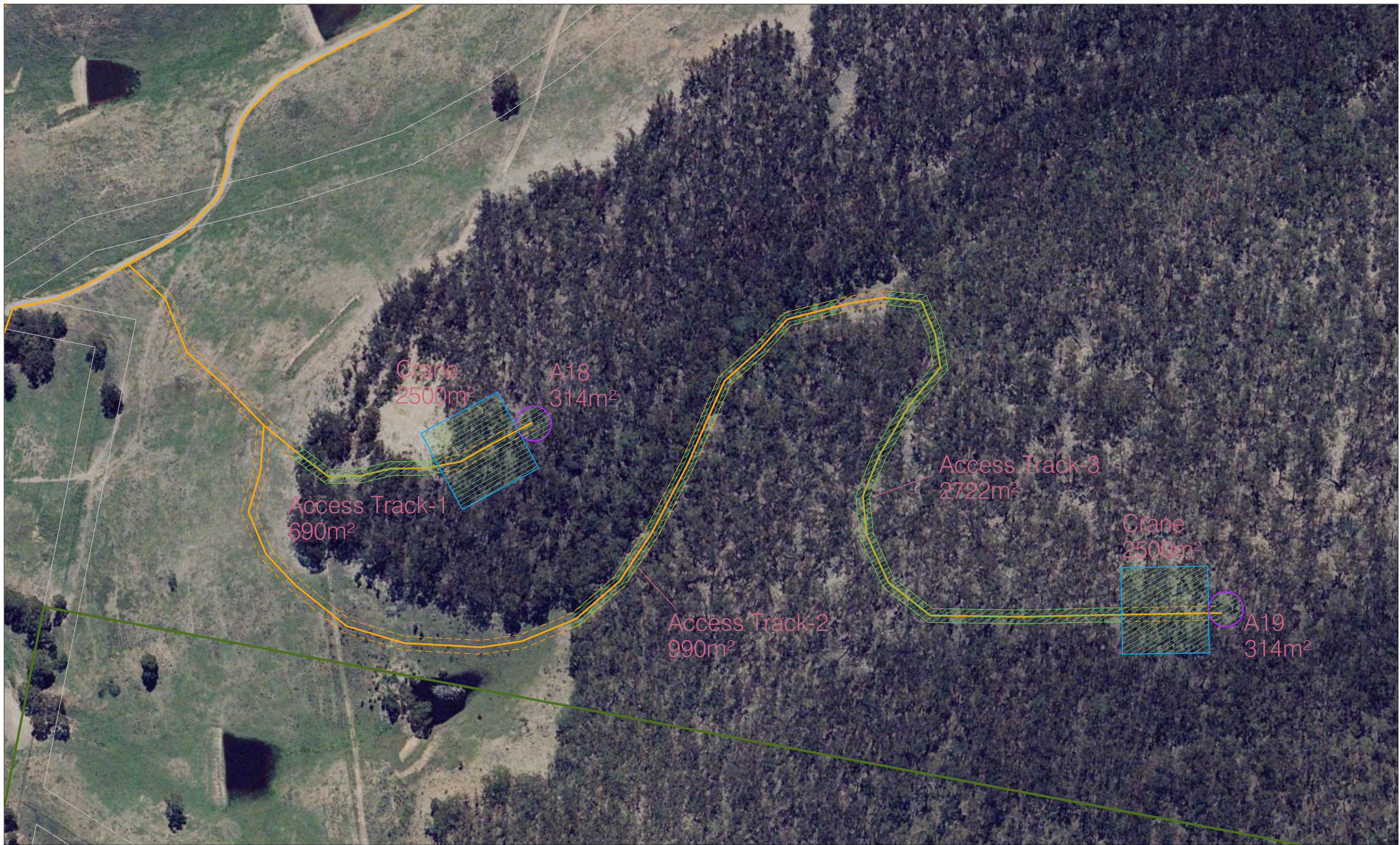


FIGURE 48 - VEGETATION REMOVAL PLAN - CROOKWELL 3 EAST AREA 2

| LEGEND | |
|--------|--------------------------------|
| | Crookwell 3 East Activity Area |
| | Turbine Footing Area |
| | Hardstand Area |
| | Tree Removal Zone |
| | Access Tracks |

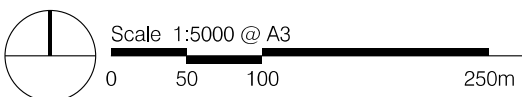


FIGURE 49 - VEGETATION REMOVAL PLAN - CROOKWELL 3 SOUTH

The assessment considered each threatened species and community which had the potential to occur within the site. This assessment was carried out in accordance with:

- the criteria contained in the EPBC Act in the case of species and communities listed under the EPBC Act; and
- the 7-Part Tests of Significance criteria in the case of species listed under the TSC Act.

Based on the field investigations and desktop reviews the assessment found that;

“The project is unlikely to have a significant impact on any communities, populations or threatened species listed under the EPBC Act or the TSC Act”.

The results of the literature review and background searches revealed that the following endangered ecological communities and threatened flora species (refer to **Table 21** below), listed under the EPBC Act and/or TSC Act had the potential to occur at the site.

Table 21 – Endangered ecological communities and threatened species with the potential to occur on site

| Species listed under EPBC Act and TSC Act | EPBC | TSC |
|---|------------|------------|
| White Box-Yellow Box-Blakely's Red Gum Grassy Woodland and Derived Native Grassland | CE | E |
| Grey Box (<i>Eucalyptus microcarpa</i>) Grassy Woodlands and Derived Native Grasslands of South Eastern Australia | E | E |
| Native Temperate Grasslands of the Southern Tablelands of NSW and the Australian Capital Territory | E | Not listed |
| Tablelands Basalt Forest | Not listed | E |
| Tablelands Forest Hollow Grassy Woodlands | Not listed | E |
| Thick-lipped Spider-orchid | V | E |
| Buttercup Doubletail | V | E |
| Basalt Pepper-cress | E | E |
| Hoary Sunray | E | V |
| Button Wrinklewort | E | E |
| Kangaloon Sun Orchid | CE | Not listed |
| Small Purple Pea | E | E |
| Tarengo Leek Orchid | E | E |
| Regent Honeyeater | E | E |
| Swift Parrot | E | E |
| Australian Painted Snipe | V | E |

| Species listed under EPBC Act and TSC Act | EPBC | TSC |
|---|------|------------|
| Glossy Black Cockatoo | V | E |
| Booroolong Frog | E | E |
| Yellow-spotted Tree Frog | CE | E |
| Growling Grass Frog | V | E |
| Golden Sun Moth | CE | E |
| Tiger Quoll | E | V |
| Brush-tailed Rock Wallaby | V | E |
| Macquarie Perch | E | Not listed |
| Grassland Earless Dragon | E | E |
| Broad-headed Snake | V | E |

Key: CE= Critically Endangered, E= Endangered, V = Vulnerable

The results of the initial field surveys detected no Endangered Ecological Communities or individual threatened species listed under either the EPBC Act or the TSC Act within the site. As the original field surveys were undertaken out of the Spring/Summer season when certain species are in flower or are more readily detectable, additional targeted surveys which were undertaken from October 2010 to January 2011 to target threatened species.

These additional surveys did not detect any threatened species within the site and confirmed the results of the original surveys.

It was found that most of the areas where the turbines and access roads/electricity easements are proposed represent cleared grazing paddock with high levels of disturbance and limited fauna habitat for most of the fauna listed. The report identified that only three of the proposed turbines are located in forested areas and these are proposed turbines A12, A18 and A19. In general, it is likely that these three turbines can be erected using minimal impact and removal of vegetation.

As no EEC or threatened species would be impacted no offsets are required under the TSC Act (1995) or the EPBC Act (1999). However, as there will be an impact on native vegetation the proponent has decided to provide an offset for this loss of native vegetation. See **Chapter 14.3** above for further details.

The report notes that as many of the existing access roads within the site will be used for the project, the level of impacts on the land is reduced, and it is expected that there will be no impacts on stream habitats. As the land is already fragmented there are considered to be no likely biodiversity corridor impacts.

The report notes that there is potential for bird and bat strike to turbines as part of any proposed wind farm development. However, Anderson Environmental consider that the potential losses of bats or raptors due to impacts with turbines to be 'extremely low', and losses of birds due to impacts with turbines to be 'low'.

The assessment found that no bird or bat species are likely to have their foraging areas or migratory patterns significantly disturbed by the proposal. The habitats are adjacent and similar to the Crookwell 2 Wind Farm and the ecological report for Crookwell 2 also found that there was unlikely to be any significant impacts on bird or bat species.

The assessment concluded that no potential bird or bat migratory species were detected on site and *“the potential impacts would not interfere with any potential migratory corridors or areas”*.

In conclusion, the assessment found that:

- *The project is not likely to result in a significant impact on any endangered ecological community or flora species listed under the EPBC Act. Accordingly, the project is not considered, for this reason, to be a controlled action which requires approval under the EPBC Act.*
- *The project is not likely to result in a significant impact on any fauna species listed under the TSC Act. Accordingly, there is no requirement for a species impact statement to be prepared.*
- *The project is consistent with the principles of “improve or maintain” in relation to ecological impacts and although no offset is required, an offset of 60 ha is being proposed for extent of clearing required for the project (estimated to be approximately 2.34 ha in total).*

14.5 Mitigation

The following recommendations are made in the Flora and Fauna Report in relation to the implementation of the project:

Bat Monitoring and Habitat Tree Inspections

Once the roads are pegged by surveyors potential hollow habitat trees (that require removal) should be identified by ecological survey. These trees should be stag watched at dusk using infra-red spotlights and anabat detectors to determine usage by any threatened microchiropteran bats. Accessible tree hollows that require removal should be inspected for fauna by infrared telescopic camera prior to removal to ensure that no species present in the hollow are harmed during removal. An Ecologist should be present on site when any hollow trees are removed to assist in relocating any fauna which may be found to occur.

Bird Monitoring and Bat Strike Monitoring

An additional baseline pre-commissioning survey should be undertaken at each turbine site during the spring/summer season. This would provide baseline data for the bird and bat strike monitoring study which should be undertaken during the first year of the operation of the wind farm.

Vegetation/Ecological Restoration Management Plan

A vegetation/ecological restoration plan should be undertaken for the areas that are disturbed as part of the construction works so they can be rehabilitated once construction is finalised. This would entail details for the management of any areas of native vegetation to be disturbed and the method and timing for their restoration along with specifics or habitat restoration for fauna and weed management. The proposed two PVP agreements proposed to be entered into in relation to the remnants in the vicinity of Turbines 18 and 19 will ensure that they are protected for conservation purposes.

Riparian Vegetation Management Plan

A riparian vegetation management plan should be undertaken for the proposed creek crossings. This would only be required for areas where there is any native vegetation to be disturbed.

