

# PROPOSED MODIFICATION NO.5 SPRING FARM QUARRY CONSENT (DA 75/256)

Lot 22 (No. 186) DP 833317 and Part  
Lot 32 (No. 172) (DP 635271)

Macarthur Road, Spring Farm

## ENVIRONMENTAL ASSESSMENT



Prepared For:



M. Collins and Sons Holdings Pty Ltd

Prepared By:



August 2020

### APPENDIX M



# LANDSCAPE REHABILITATION AND BUSH REGENERATION REPORT

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**SPRING FARM QUARRY**

**(Proposed Modification 5)**

**Compiled by – M Collins & Sons Holdings Pty Ltd with assistance from  
Aptical Pty Ltd and Bowantz Bushfire and Environmental Pty Ltd**

**24 August 2020**

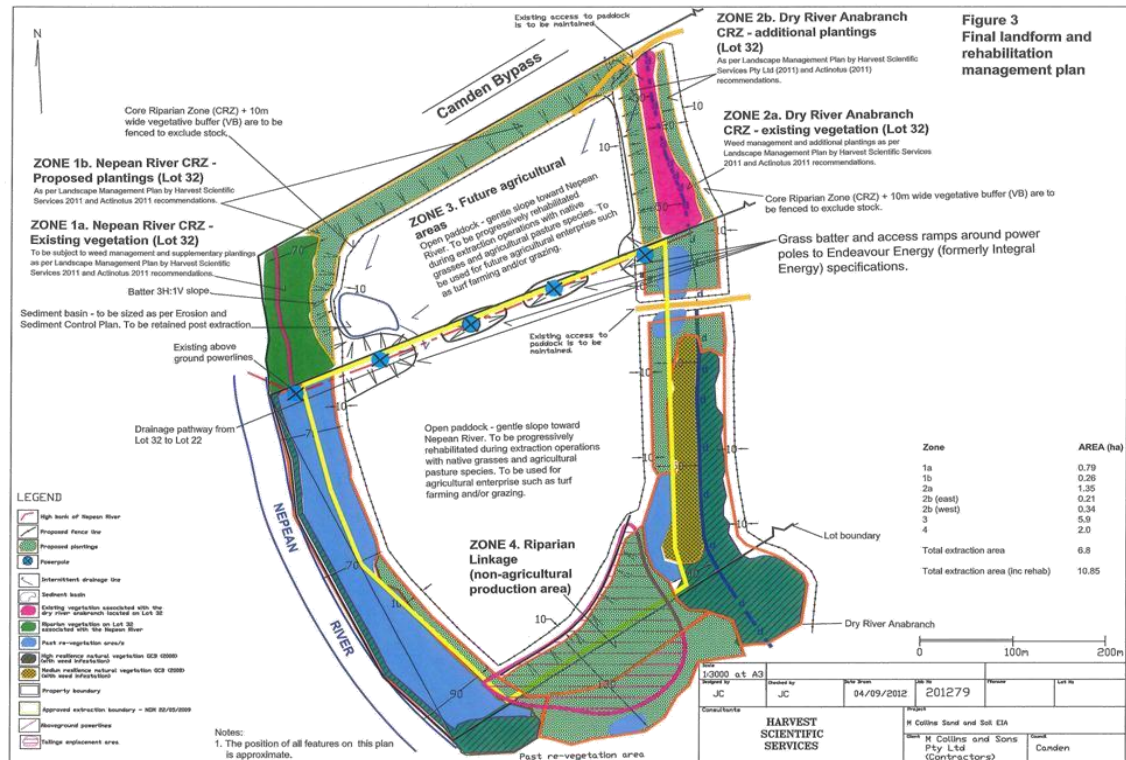
## **(1) Introduction**

This Report provides an overview of the Landscape rehabilitation and Bush Regeneration work that has taken place over recent years at the Spring Farm Quarry, in accordance with the various consent requirements (inclusive of the commitments made by M Collins & Sons Holdings Pty Ltd). It concludes with the implications for an expanded timeframe for on-site activities culminating in a projected quarry closure on 30 June 2023.

The Report is structured to address the following landscape “zones”:

- Zone 1(a) – Nepean River – Core Riparian Zone existing vegetation on riverside bank extending to river edge at lot 32
- Zone 1(b) – Northern Quarry Batter – Establishment of natural vegetation post extraction on Lot32
- Zone 2 (a) – Dry River Anabranh – Core Riparian Zone additional plantings on the western bank on Lot32
- Zone 2 (b) – Dry River Anabranh – Core Riparian Zone existing vegetation on the eastern bank on Lot 32
- Zone 3 – Agriculture Production Lands – Post extractive land use return to Agriculture on Lot 32
- Zone 4- Non-Agricultural Land on Lot 22- Provides a permanent elevated linkage between the Nepean River and the Dry Anabranh
- Zone 7 - Dry River Anabranh on Lot 1 – Comprising Core Riparian zone along the western bank

**Figure 3. Final Landform and rehabilitation management plan**



## (2) Current Condition of Landscape and Bush regeneration Areas (In response to recent actions)

### **2.1 Zone 1(a): Nepean River -Landscape Rehabilitation and Bush Regeneration Works Summary**

This zone was mapped by ecologists Actinotis in 2011 as Riparian forest on coastal floodplain. It comprises a natural stand of forest up to twenty-five metres in height dominated by River Peppermint and Broad-Leafed Apple with River She-oak populating the river edge.

The extent of the area is 7,000 square metres and the work completed has been extensive involving removal of woody weeds and wandering dew in the groundcover.

The revegetation program in this area was completed in July 2018. It consisted of a program of 2,000 forestry tube stock selected from over thirty native species (refer Appendix A).

Over the 2019/20 period, weed control within the native vegetation stand of zone 1(a) was a priority action. Tasks such as secondary and maintenance weeding of re-emergent invasive spp. and herbaceous weedy annual plants was carried out throughout the period.

The riparian vegetation corridor formed by this area is providing an important habitat linkage for fauna migration along the river corridor. The native vegetation structure has benefitted from concerted woody weed control and revegetation efforts over recent years and is currently presenting in good condition, with limited weed diversity.

There have been four habitat nest boxes installed within the bushland areas

Remnant and established vegetation structure in this zone create an important bank stabilisation feature for the River at this location by providing geomorphic form and flood resistance for the riverine landscape. It is essential to maintain and increase structural vegetation extent in this area.

### **2.2 Zone 1 (b): Northern Quarry Batter- Landscape Rehabilitation and Bush Regeneration Works Summary**

This area of vegetation was mapped by Actinotis as Alluvial Woodland on Coastal Floodplain and it comprises a mature thirty-metre high stand of woodland dominated by River Peppermint, Broad Leafed Apple, and River She-oak. Associated shrub species found here include Blackthorn, Twiggy, Heath Myrtle, Scrubby Spurge and Bamboo Grain in the ground cover.

The woodland comprises approximately 5,000 square metres and since 2014 when bush regeneration commenced in this area the predominant weed infestations that have been targeted are woody weeds and wandering dew.

Currently more than ninety per cent of the restored embankment areas are supported by ground cover. Additional vegetation including trees and shrubs in this area are scheduled for planting in autumn 2021. Larger structural plants will provide deeper and broader root systems that will aid in enhanced stabilisation of the alluvial soils.

There are a further 2,000 tube stock native plants scheduled to be installed in dense pockets no more than two metres apart in a planting campaign in the autumn of 2021. The plant species can be found in Appendix A.

Installation of ten nesting boxes targeting arboreal marsupials has been completed. Brush tail possums are active in the area with sufficient existing habitats however the following nesting boxes were installed to enhance the existing habitat:

- |                         |                 |
|-------------------------|-----------------|
| • Ringtail possum       | 2 nesting boxes |
| • Feather tailed glider | 2 nesting boxes |
| • Kookaburras           | 2 nesting boxes |
| • Pardalotes            | 4 nesting boxes |

### **2.3 Zone 2(a) Dry river Anabranh - Landscape Rehabilitation and Bush Regeneration Works Summary**

This natural zone contains established mature vegetation that required structural management involving pruning of limbs, cutting and removing dead material and revegetation with native plants. These activities constitute the primary works in this zone. In addition, fencing was erected along the eastern boundary to exclude stock and animals (owned by others) adversely impacting the zone. It is noted that there are no animals grazed on the property.

An irrigation line together with a storage tank was commissioned to assist the establishment of tube stock that have been planted within this area during the recent drought (Spring 2019).

This area is scheduled to have supplementary planting undertaken to replace tube stock that failed during the drought.



Zone 1a. & Zone 5. Riparian Forest Restoration works.



- Nesting Boxes
- Revegetation Zone
- Bank Stabilisation
- Secondary Weed Control
- Primary Weed Control

0 10 20 40 60 80 Meters

*Note: This map is for visual representation, the position of all features on this plan is approximate.*





Typical nesting box installed

#### **2.4 Zone 2 (b): Western side of Dry Anabanch - Landscape Rehabilitation and Bush Regeneration Works Summary**

This area has undergone weed maintenance activities targeting the eradication of *Olea europaea*, *Africana*, *Eragrostis curvula* and *Acetosa sagittaria*, followed by secondary weed treatment.

The tube stock plantings in this area cannot occur until the final landform on the eastern side of the anabranch on Lot 22 and Lot 32 has been fully extracted. This area will comprise the last areas to be rehabilitated/regenerated.

#### **2.4 Zone 3: Reconstructed Agricultural Lands Lot 32 - Landscape Rehabilitation Works Summary**

This zone is located in the open paddock area surrounded on three sides by the batters facing the Camden By-Pass bridge and adjoining the Nepean River on the west and the dry anabranch on the eastern side.

The landform is rehabilitated in one-hectare sections that minimise the footprint of the disturbed land and ensures the re-establishment of natural pasture can be completed within the spring or autumn period

The entire ground surface is ripped along the contours to fracture the soil and then cross ripped to help retain moisture in the subsoil.

The entire surface is then backfilled with a minimum of 500mm stockpiled topsoil. Once the surface preparation is completed grass is planted and additional pasture is sown into the topsoil. Irrigation is applied where required to ensure successful germination occurs. The pasture is maintained as required throughout the year.

#### **2.4 Zone 4 – Linkage Zone between the Riparian Area and the Dry Anabranch - Landscape Rehabilitation and Bush Regeneration Works Summary**

This zone is considered a zone of ecological importance as it links the Nepean River Riparian Corridor and the Dry River Anabranch remnant vegetation corridor providing a broad connection and habitat corridor for native wildlife to traverse the site.

The riparian vegetation corridor formed by this area provides an important habitat linkage for fauna migration along the river corridor. The native vegetation structure has benefited from concerted woody weed control and revegetation efforts over recent years and is currently presenting in good condition with limited weed diversity.

Remnant and established vegetation structure have created an important bank stabilisation structure for the river at this location by providing geomorphic form and flood resistance. This was evidenced by how well (in February 2020) the landform withstood a ten-metre inundation. The structural vegetation will continue to improve over time in this area.

## **2.5 Zone 7- Anabran South - Landscape Rehabilitation and Bush Regeneration Works Summary**

Zone 7 is classed as 'open sclerophyll forest' with the plant community type being observed as 'River Flat Eucalypt Forest'. This zone offers substantial ecological restoration opportunity due to its intact connectivity to the Nepean River Riparian Corridor and River itself to the south of the zone.

Over the 2018/19 and 2019/20 works program this zone received extensive and ongoing restoration through the application of primary woody weed control. This area contains some valuable remnant trees and forms an important vegetation transition between the Alluvial Cumberland Plain Woodland and the Riparian Forest on Coastal Floodplains vegetation forms which integrate within this area of the site.

It is a successful regeneration zone that is associated with remnant vegetation within the zone. It is providing ongoing habitat and refuge for *Pomaderris brunnea* – (Brown Pomaderris) which is an endangered (NSW status) plant species that grows in moist woodland or forest on clay and alluvial soils of flood plains and creek lines. The alluvial forested areas associated with this Zone 7 remains a viable population of this plant

### **(3) Conclusion – Landscape Rehabilitation and Bush Regeneration Report**

From the preceding commentary it can be concluded that the rehabilitation and bush regeneration works have been successful to date as is evidenced by:

- A reduction in the amount of exposed extraction areas
- Successful groundcover establishment in future pasture areas or passive recreation areas
- Enhanced biodiversity including corridor linkages
- Preservation of endangered species
- Reduced weed presence
- Successful performance in high river flows and inundation by floodwaters
- Minimisation of adverse visual impacts

An extension of the timeframe for concluding activities to 30 June 2023, as proposed in Modification No. 5 will enable consolidation of the rehabilitation and bush regeneration work undertaken to date and completion of the overall rehabilitation program in a structured manner, with attendant positive ecological, visual, post extractive use and public interest outcomes generally.

## **APPENDIX A -SPRING FARM QUARRY PLANT VARIETIES 2017-20**

Angophora subvelutina Broad-leafed apple Forestry tube stock July 2018  
Angophora floribunda Rough bark apple Forestry tube stock July 2018  
Casuarina cunninghamiana River She-oak Forestry tube stock April 2017  
Casuarina glauca Swamp She-oak Forestry tube stock July 2018  
Eucalyptus amplifolia Cabbage gum Forestry tube stock April – May 2017  
Eucalyptus elata River peppermint Branch mulching – Direct seeding  
Eucalyptus tereticornis Forest Red gum Forestry tube stock May 2017  
Eucalyptus viminalis Ribbon gum Forestry tube stock July 2018  
Eucalyptus paramattensis Drooping Red Gum Forestry tube stock July 2018  
Eucalyptus piperita Sydney Peppermint Forestry tube stock July 2018  
Eucalyptus globoides White stringybark Forestry tube stock July 2018  
Melia azedarach White cedar Forestry tube stock April – May 2017  
Acacia floribunda Sally Wattle Branch mulching – Direct seeding  
Acacia decurrens Black wattle Forestry tube stock July 2018  
Trema tomentosa Native peach Forestry tube stock July 2018  
Dodonea triquetra Hop bush Forestry tube stock April – May 2017  
Callistemon salignus Willow bottlebrush Forestry tube stock July 2018  
Callistemon linearifolius Netted bottlebrush Forestry tube stock July 2018  
Melicytus dentatus Tree violet Forestry tube stock April – May 2017  
Bursaria spinosa Blackthorn Forestry tube stock May 2017  
Kunzea ambigua Tick bush Forestry tube stock May 2017  
Leptospermum Polygalifolium  
Lemon scented Tea-tree Forestry tube stock May 2017  
Olearia microphylla Daisy bush Forestry tube stock July 2018  
Dodonea viscosa Sticky hop bush Forestry tube stock July 2018  
Wahlenbergia gracilis Blue bell Forestry tube stock July 2018  
Lomandra longifolia Matt Rush Hiko tube stock April – May 2017  
Carex appressa Tall sedge Hiko tube stock May 2017  
Austrostipa ramosissima Stout bamboo grass Direct seeding April – May 2017  
Aristida ramosa Purple Wire grass Hiko tube stock July 2018 July 2018  
Commelina cyanea Scurry weed Hiko tube stock May 2017  
Glycine clandestina Twining glycine Hiko tube stock April – May 2017  
Dichelachne micrantha Short hair plume grass Hiko tube stock July 2018  
Microlaena stipoides Weeping rice grass Hiko tube stock July 2018  
Chenopodium nutans Climbing salt bush Hiko tube stock July 2018