

**ARBORICULTURAL ASSESSMENT REPORT  
New Public School - Estella (Wagga Wagga) NSW - 2019.**

**1. INTRODUCTION.**

There is a new public school proposed for the suburb of Estella in Wagga Wagga NSW. Hansen Yuncken have been awarded the construction by NSW School Infrastructure, which is a state signification development application (SSDA).

A preliminary arboricultural assessment was conducted as part of the planning phase through 2018 and a report dated 2018 furnished at that time. This report is an undated version of the 2018 report based on final design for development application/approval.

The site is a 3 ha 'greenfield' site that did form part of the southern area of Charles Sturt University, on the north side of Estella Road.

**2. SCOPE, PURPOSE and METHODOLOGY.**

Mr. Paul Nelson, Design Manager with Hansen Yuncken has commissioned this report, he can be contacted on 0428 045 649. The site was visited, and field data recorded on Friday 3 August 2018, and a review of the site was conducted on Thursday 17 October 2019.

Findings and recommendations are designed to meet requirements under the Wagga Wagga City Council (WWCC) Development Control Plan 2010 and the author's interpretation of Australian Standard 4970-2009 *Protection of trees on development sites*.

The primary purpose of the report is to;

- Determine and identify notable tree vegetation and species on site.
  - Notable trees are trees that are subject to WWCC Development Control Plan 2010 – Part B section 5 - Natural Resource and Landscape Management - Preservation of trees (WWCC 2019).
- Provide details on tree dimensions, Tree Protection Zones (TPZ), condition and any defects that may pose a safety issue.
- Provide details and recommendations on identified and potential impacts on the trees from the development
- Specify tree protection measures

Some shrubs, which are not notable trees have been recorded where they appear on site plans – this is for reference purposes to avoid confusion. It should be noted that the eastern boundary of the site is now approximate 10 meters west of the original planning for site. This has effectively moved some of the trees from inside the development envelop in 2018 – to outside the development envelop in 2019.

- [Diagram one](#) provides site location.
- [Diagram two](#) – provides site layout and locations of numbered trees.
- [Table One](#) provides details of the notable trees – and specifically trees that are subject to Preservation of trees – Wagga Wagga City Council Development Control Plan 2010 (WWCC 2019), TPZ/SRZ zones, general impacts, and recommendations are recorded.
- [Table two](#) – provides full details and recommendations on specific trees identified with more complex requirements and general recommendations for the project.
- [Appendix 1](#) provides descriptors of any general hazard ratings applied.

### **3. Location and Background.**

The site is located to the north of Estella Road on the southern portion of Charles Sturt University – west of Peter Hastie Oval.



**Diagram One** – Location of proposed School and construction site – Peter Hastie Oval to right - Source Google Maps 2018.





**Diagram 2 – General Site Plan with tree numbers 1 to 36 inserted – Source adapted from Hansen Yuncken site plan.**

### Overview of Site

The site is approximately 240 meters north south and 120 meters east west - some 3 hectares and presents as former agricultural land that has not been grazed (or slashed) for several years. The tree vegetation is confined to the west, south and east boundaries. At least 2 revegetation programs have been conducted over the last 20 or more years. There are three tree lanes; on the western, southern and eastern boundaries of the block.

The western and southern tree lanes are of similar age, estimated at least 20 years, with stands of semi mature Red Box (*Eucalyptus polyanthemos*) and Yellow Box (*E. melliodora*) as the primary tree species. There are some other smaller native trees and shrubs remaining as part of this older revegetation program, *Eucalyptus leucoxylon* and *Acacia baileyana* (Cootamundra Wattle).

- The western tree lane is referred to as Block A
- The south tree lane is referred to as Block B.

A more recent tree lane (Block C) has been established on the eastern boundary which is estimated between 5 and 10 years of age. This contains a wide variety of local tree and shrub species and is densely planted, estimated about 40 stems per 100 square meters.

The interior of the block is almost all grassland, described as dense coverage with 4 very young Yellow box (*E. melliodora*) naturally occurring seedlings about 2-5m in height.



**Photo 1** – View form North boundary of site (Charles Sturt University Car Park) – with the West line of vegetation (Block A) and south line of trees block B to left of shot.





**Photo 2** – View from North east corner of site depicting the relatively new and closely planted vegetation of Block C. Pathway to left is the general east boundary that connects footpath from Charles Sturt University to Estella Road.

#### **4. General Inspection details.**

Block A – West Boundary fence line. This area of vegetation is about 20 or more years old. There are 9 notable trees in the 240 meters line and scattered shrubs mostly Cootamundra Wattle (*Acacia baileyana*). There is a concentration of 5 *Eucalyptus leucoxylon* at the north end of the block – small trees (not allocated tree numbers). These 5 trees are in poorer condition with heavy infestation of mistletoe.

The 9 notable trees are identified and included in numbering of 1 to 13 inclusive. 7 trees are mature Red Box (*E. polyanthemos*), a species which is not indigenous to the site, but is endemic to the region just east of Wagga Wagga (Stelling 1998). The 7 trees range 10-14 meters in height, stem diameters of between 300mm and 500mm, with canopy spread of about 10m. The trees are generally in good condition.

Trees 2 and 3 are Yellow Box (*E. melliodora*), indigenous species to site and located towards the northern end of the block. The two trees are in very close proximity to each other with canopies joining and there should be no impact from construction. Tree height is about 18 meters, with stem diameters about 500-600mm and canopy spread about 12-14 meters. The trees are described is in good condition.



**Photo 3** – Notable Trees in Block A- West Tree lane south end – Red Box (*E. polyanthemos*) revegetation program on western fence, boundary of site. Tree numbers and shrubs circled are recommended for removal.



**Photo 4** – Trees 2 and 3 – Yellow Box (*E. melliodora*) in the northern portion of Block A – no construction impacts.



Block B – Southern Boundary Fence. There are 20 semi mature Yellow Box (*E. melliodora*) planted on the south boundary fence line that commence at the east boundary of the site and extend some 70-80 meters in westerly direction. The trees are effectively one tight group of trees with generally upright habit due to close planting spaces. They share canopy space and root zones. Stem spacings are about 4-5 meters. The height of the trees is various between 10 and 18 meters, the stem diameters range from 250mm to 550mm, and the canopy spread varies 6-12 meters. The trees are generally in good condition, although there are some stem and branch defects described as higher risk will need to be addressed in an amenity situation and in line with NSW Department of Education Tree Management Guidelines (2015). The species is endemic to the site.



**Photo 6** – View of Block B – 20 Yellow Box (*E. melliodora*) on the south east boundary fence of Estella Road.



**Photo 7** – Close view of middle section of Block B – Yellow Box Trees.



**Photo 8** – Yellow Box tree in Block B – higher risk defect -bifurcation in stem system that often leads to failure. Example of defect in group of trees that will need to be reviewed and addressed within the new amenity context.

Block C – Eastern boundary of site. Block C is some 30 meters wide and extends for most of the eastern boundary – an area of some 0.5 hectares. There is noted difference in the east boundary of the development from 2018 to current – the current design has the east boundary running through block C – NOT to the east of block C.

The planting is estimated between 5 and 10 years of age. A large range of endemic species has been used including;

- *Eucalyptus albens* (White Box)
- *Eucalyptus melliodora* (Yellow Box)
- *Eucalyptus sideroxylon* (Iron Bark)
- *Eucalyptus bridgesiana* (Apple box)
- *Brachychiton populneus* (Kurrajong)
- *Casuarina cunninghamiana* (She Oak)
- *Callitris columellaris* (Native Cypress)
- Various Acacia species and other small shrubs not identified to species.

The trees are described as young saplings, with average height of about 3-4 meters and several trees to 8-10m. Stem diameters vary up to 125-150mm. The revegetation block is described as an excellent result with a very good



diversity of species and few mortalities. The stem density is about 40 stems per 100 square meters. There are several notable trees in the block, that would be 8m or more in height that would meet requirements of the WWCC Preservation of Trees legislation. Some of the southern portion of the planting is required to be removed to accommodate buildings.



**Photo 9 –  
Block C –**  
*Younger  
revegetation  
program.  
Example of  
the middle  
section with  
species  
diversity  
including  
Eucalyptus,  
Acacia,  
Callitris and  
others*

## **5. Design Overlay – Summary of impacts on tree population.**

The 2019 Proposed Site plan (Hansen Yuncken 2019) is noted with less tree impacts than of Proposed Site Plan (Hayball 2018).

The following summary of tree impacts are noted; and individual tree impacts are contained in tables one and two below.

- Block A
  - There are two notable trees that will require removal under this plan – Trees 5 and 10 – to accommodate development.
  - A number of shrubs will require removal, which are not notable. Quite a number of Cootamundra Wattles (*A. baileyana*) will be removed – which are not subject to WWCC development control Plan. This includes trees numbered 4, 5 & 7.
- Block B – all notable trees can be retained with some incursion of tree protection zones, but acceptable impacts with prudent management.
- Block C – Recent revegetation program – Some portion of the south section will be removed to accommodate buildings. Taking into account that the east boundary now runs through the Block C – revegetation tree allotment – the current proposal would appear to retain more than the 2018 plan.

## **6. Discussion**

Values of the Current Tree Population. The proposed site has effectively been unused for the last 3-5 years, possibly more.

I do not consider any of the individual trees are significant, remnant or individually high ecological value. All trees on the site are young trees and there are no nesting hollows or cavities. There is some argument that the group of Yellow Box (*E. melliodora*) trees 16-36 have some significance as a group of indigenous trees, based on environmental/ecological values of the group of 20.

All the trees are part of revegetation programs over the last 20 or so years. As a group of trees there is notable ecological values associated with the revegetation programs. Yellow Box (*E. melliodora*) is the indigenous *Eucalyptus* species that dominates the immediate landscape with Red Gum (*E. blakelyi*). Block B presents a good young stand of Yellow Box. In Block C – the larger species that is now started to dominate is also Yellow Box. Block A also has two large semi mature Yellow Box trees.

The three blocks of vegetation also play an important role in fauna foraging sites and linking other stands of remnant and native vegetation that has been planted across the southern area of Charles Sturt University and into the undeveloped hills that contain remnant vegetation.

Cootamundra Wattle (*Acacia baileyana*) is the dominant shrub vegetation in Block A. This acacia species is not endemic to the local area and is listed by Wagga Wagga City Council as an undesirable Tree species (WWCC 2019), due to its prolific seeding and germinating ability.

Block C – Recent Revegetation program. The indicated loss of some of this revegetation program is required to accommodate buildings. The loss of small trees and shrubs is clearly preferable to the loss of semi-mature and larger trees; small trees can be easily replaced in the short term, < 5 years.

Red Box (*Eucalyptus polyanthemos*) is not endemic to the location. Red Box is endemic to the Kyeamba Valley immediately east of Wagga Wagga (Stelling 1998), and the species was widely planted through the 1970's and 1980's as a smaller growing *Eucalyptus* species in many roadside and other revegetation areas. The species has proved somewhat short lived in many of these types of plantings around Wagga Wagga.

Potential for Additional Growth.

Trees 8 to 13 (Red box) have only small potential for further growth. The species is not generally a large or long-lived tree in revegetation planting such as this site. Trees 2 and 3 (Yellow Box) – are described as semi



mature. Both trees have significant scope for increase in height, but specifically canopy spread as they develop into mature stage of life cycle.

Block B – 20 Yellow Box (*E. melliodora*) – trees are planted at close spacings which will affect their potential for large size at maturity. Some of the trees have already commenced to dominate over others. They are however already medium sized trees with good potential for increased in size, both height and canopy spread. They will require space to develop further and negate impacts on infrastructure.

## **7. Impacts and Recommendations.**

- i. Removal of Cootamundra Wattle (*A. baileyana*) (including trees numbered 4, 5 & 6 is supported based on species status under the Wagga Wagga Development Control Plan and size under 8m.
- ii. Removal of only two notable trees is required for development.
  - i. There are no significant trees to be removed.
  - ii. Removal of notable trees 5 and 10 Red Box (*E. polyanthemos*) is supported to allow development – the proposed development is well inside the TPZ and close to the structural root zone and retention is not advised under this plan.
- iii. The 2019 site plan now supports the full retention of trees 16-36 – Yellow Box (*E. melliodora*), noting that Tree 16 will require some management planning. This is obviously an improved outcome on the 2018 site plan, and fully supported.
- iv. Removal of part of the recent revegetation program – Block C is supported as most of the stems are under the 8m in height, there is a requirement to place buildings somewhere on the site and loss of small shrubs and trees is preferable to loss of larger trees – nearly all of which are being retained.
  - i. Replacement of the small trees and shrubs will be achievable in the short term with new plantings.
- v. There is clear opportunity within the landscape plan to enhance the project area regarding new plantings that will provide increased amenity, environmental and ecosystem values to current tree vegetation.

[Tables one](#) provides individual tree details and tree protection zones (TPZ) and recommendations.

[Table Two](#) provides details on trees with more complex requirements and general requirements.

[Full details of Descriptors and Evaluation methods contained below.](#)

| Table One – Individual Tree Inspection Details |                                               |           |                      |           |                              |              |                                                                                                                                                 |                 |                                                                         |
|------------------------------------------------|-----------------------------------------------|-----------|----------------------|-----------|------------------------------|--------------|-------------------------------------------------------------------------------------------------------------------------------------------------|-----------------|-------------------------------------------------------------------------|
| Tree No                                        | Species & Origin                              | Age Class | Dimensions D/H/C (m) | Condition | TPZ/SRZ (m radius from stem) | TPZ Impact % | Comments                                                                                                                                        | Retention Value | Recommend.                                                              |
| 1                                              | <i>Eucalyptus melliodora</i><br>Indigenous    | Y         | small sapling        | good      | 2/1.5                        | 100          | Very small tree less than 8m – exempt – WWCC<br>Loss of vegetation easily replaced                                                              | Low             | Remove to accommodate school oval - infrastructure                      |
| 2                                              | <i>Eucalyptus melliodora</i><br>Indigenous    | Semi      | 0.6/17/12            | good      | 6.6/2.57                     | 0            | Local species – high environmental values<br>No development impacts                                                                             | High            | Project should be able to set exclusion zone well outside TPZ           |
| 3                                              | <i>Eucalyptus melliodora</i><br>Indigenous    | Semi      | 0.6/17/12            | good      | 6.6/2.57                     | 0            | Local species – high environmental values<br>No development impacts                                                                             | High            | Project should be able to set exclusion zone well outside TPZ           |
| 4                                              | <i>Acacia baileyana</i><br>Aust Native        | M         | Small shrub          | good      | 2/1.5                        | 100          | Species listed as undesirable<br>Tree less than 8m – exempt WWCC.<br>Amenity loss very small                                                    | Very low        | Remove to accommodate development<br>Exempt species                     |
| 5                                              | <i>Eucalyptus polyanthemos</i><br>Aust Native | M         | (2x0.4)/15/12        | fair      | 6.8/2.6                      | 40%          | Bifurcation is stem – moderate risk – old infestation of longicorn borer – tree appears to have recovered<br>Encroachment of TPZ not acceptable | Medium          | Remove to accommodate building – cannot be retained under current plan. |
| 6                                              | <i>Acacia baileyana</i><br>Aust Native        | M         | Small shrub          | good      | 2/1.5                        | 100          | Species listed as undesirable<br>Tree less than 8m – exempt WWCC.<br>Amenity loss very small                                                    | Very low        | Remove to accommodate development                                       |
| 7                                              | <i>Acacia baileyana</i><br>Aust Native        | M         | Small shrub          | good      | 2/1.5                        | 100          | Species listed as undesirable<br>Tree less than 8m – exempt WWCC.<br>Amenity loss very small                                                    | Very low        | Remove to accommodate development                                       |
| 8                                              | <i>Eucalyptus polyanthemos</i><br>Aust Native | Y         | .26/8/5              | good      | 3.12/1.88                    | 0            | Small tree<br>Retain as part of native vegetation                                                                                               | Medium          | Project should be able to set exclusion zone well outside TPZ           |
| 9                                              | <i>Eucalyptus</i>                             | M         | (2x.37)/15/8         | Good      | 6/2.5                        | 0            | Retain as part of native                                                                                                                        | Medium          | Project should be                                                       |

| Table One – Individual Tree Inspection Details |                                               |           |                      |           |                              |              |                                                                                                                                                                              |                 |                                                                          |
|------------------------------------------------|-----------------------------------------------|-----------|----------------------|-----------|------------------------------|--------------|------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|-----------------|--------------------------------------------------------------------------|
| Tree No                                        | Species & Origin                              | Age Class | Dimensions D/H/C (m) | Condition | TPZ/SRZ (m radius from stem) | TPZ Impact % | Comments                                                                                                                                                                     | Retention Value | Recommend.                                                               |
|                                                | <i>polyanthemos</i><br>Aust Native            |           |                      |           |                              |              | vegetation                                                                                                                                                                   |                 | able to set exclusion zone well outside TPZ                              |
| 10                                             | <i>Eucalyptus polyanthemos</i><br>Aust Native | M         | .48/9/7              | Good      | 5.8/2.5                      | 35-40%       | Sound tree. Impacts not acceptable to retain tree.                                                                                                                           | Medium          | Remove to accommodate development                                        |
| 11                                             | <i>Eucalyptus polyanthemos</i><br>Aust Native | M         | .4/11/12             | Good      | 4.8/2.5                      |              | Retain as part of native vegetation                                                                                                                                          | Medium          | Project should be able to set exclusion zone well outside TPZ            |
| 12                                             | <i>Eucalyptus polyanthemos</i><br>Aust Native | M         | (3x.35)/9/12         | Good      | 7.32/2.9                     |              | Retain as part of native vegetation                                                                                                                                          | Medium          | Project should be able to set exclusion zone well outside TPZ            |
| 13                                             | <i>Eucalyptus polyanthemos</i><br>Aust Native | M         | .55/9/14             | Excellent | 6.6/2.7                      |              | Retain as part of native vegetation                                                                                                                                          | Medium          | Project should be able to set exclusion zone well outside TPZ            |
| 14                                             | <i>Acacia species</i><br>Aust Native          | M         | Small shrub          | fair      | 2/1.5                        |              | Very small tree less than 8m – exempt – WWCC<br>Loss of vegetation easily replaced                                                                                           | Low             | Project should be able to set exclusion zone outside TPZ                 |
| 15                                             | <i>Acacia species</i><br>Aust Native          | M         | Small shrub          | fair      | 2/1.5                        |              | Very small tree less than 8m – exempt – WWCC<br>Loss of vegetation easily replaced                                                                                           | Low             | Project should be able to set exclusion zone outside TPZ                 |
| 16                                             | <i>Eucalyptus melliodora</i><br>Indigenous    | Semi      | (2x.45)/18/12        | good      | 7.7/2.74                     | 30% possible | High environmental values – forms part of 20 Tree block of semi mature Indigenous species<br>Proposal to retain tree and place walkway/entrance around 2 sides of tree stem. | High            | Retain.<br>See specific narrative on tree for recommendations – Table 2. |
| 17                                             | <i>Eucalyptus melliodora</i>                  | Semi      | (2x400)/18/12        | good      | 6.84/2.61                    |              | High environmental values – forms part of 20 Tree block of                                                                                                                   | High            | Retain.                                                                  |



| Table One – Individual Tree Inspection Details |                                            |           |                      |           |                              |              |                                                                                                                 |                 |                                                     |
|------------------------------------------------|--------------------------------------------|-----------|----------------------|-----------|------------------------------|--------------|-----------------------------------------------------------------------------------------------------------------|-----------------|-----------------------------------------------------|
| Tree No                                        | Species & Origin                           | Age Class | Dimensions D/H/C (m) | Condition | TPZ/SRZ (m radius from stem) | TPZ Impact % | Comments                                                                                                        | Retention Value | Recommend.                                          |
|                                                | Indigenous                                 |           |                      |           |                              |              | semi mature Indigenous species                                                                                  |                 |                                                     |
| 18                                             | <i>Eucalyptus melliodora</i><br>Indigenous | Semi      | .47/12/12            | Good      | 5.6/2.4                      | 10% possible | High environmental values – forms part of 20 Tree block of semi mature Indigenous species                       | High            | Retain – Proposed footpath may impact – see table 2 |
| 19                                             | <i>Eucalyptus melliodora</i><br>Indigenous | Semi      | .47/16/8             | fair      | 5.7/2.7                      |              | High environmental values – forms part of 20 Tree block of semi mature Indigenous species                       | High            | Retain                                              |
| 20                                             | <i>Eucalyptus melliodora</i><br>Indigenous | Semi      | (2 x .54)/16/8       | fair      | 9.1/3                        |              | High environmental values – forms part of 20 Tree block of semi mature Indigenous species                       | High            | Retain                                              |
| 21                                             | <i>Eucalyptus melliodora</i><br>Indigenous | Semi      | (2x0.4)/15/8         | good      | 6.9/2.7                      |              | High environmental values – forms part of 20 Tree block of semi mature Indigenous species                       | High            | Retain                                              |
| 22                                             | <i>Eucalyptus melliodora</i><br>Indigenous | Semi      | (5x.15)/8/3          | poor      | 4/2.7                        |              | High environmental values – forms part of 20 Tree block of semi mature Indigenous species. Central leader dead. | High            | Retain                                              |
| 23                                             | <i>Eucalyptus melliodora</i><br>Indigenous | Semi      | .5/15/8              | Good      | 6/2.7                        |              | High environmental values – forms part of 20 Tree block of semi mature Indigenous species                       | High            | Retain                                              |
| 24                                             | <i>Eucalyptus melliodora</i>               | Dead      | (2x.2)/10/2          | Very poor | 2/2                          |              | Dead tree – no hollows – very low to low environmental values                                                   | Low             | Remove – stems will fail in time.                   |

| Table One – Individual Tree Inspection Details |                                            |           |                      |           |                              |              |                                                                                                                                       |                 |                                                                  |
|------------------------------------------------|--------------------------------------------|-----------|----------------------|-----------|------------------------------|--------------|---------------------------------------------------------------------------------------------------------------------------------------|-----------------|------------------------------------------------------------------|
| Tree No                                        | Species & Origin                           | Age Class | Dimensions D/H/C (m) | Condition | TPZ/SRZ (m radius from stem) | TPZ Impact % | Comments                                                                                                                              | Retention Value | Recommend.                                                       |
|                                                | Indigenous                                 |           |                      |           |                              |              | Potential for stem failure to student drop off area                                                                                   |                 |                                                                  |
| 25                                             | <i>Eucalyptus melliodora</i><br>Indigenous | Semi      | (2x.28)/17/8         | fair      | 4.8/2.25                     |              | High environmental values – forms part of 20 Tree block of semi mature Indigenous species<br>Bifurcated stems at ground – higher risk | High            | Retain<br>Prune – reduce canopy by 25% to ameliorate stem defect |
| 26                                             | <i>Eucalyptus melliodora</i><br>Indigenous | Semi      | (3x.33)/17/8         | fair      | 6.84/2.61                    | 15% Possible | High environmental values – forms part of 20 Tree block of semi mature Indigenous species                                             | High            | Retain – impact from footpath possible – see table 2             |
| 27                                             | <i>Eucalyptus melliodora</i><br>Indigenous | Semi      | .26/15/8             | fair      | 3.12/1.88                    |              | High environmental values – forms part of 20 Tree block of semi mature Indigenous species                                             | High            | Retain                                                           |
| 28                                             | <i>Eucalyptus melliodora</i><br>Indigenous | Semi      | (2x.5)/18/9          | fair      | 8.52/2.87                    |              | High environmental values – forms part of 20 Tree block of semi mature Indigenous species<br>Bifurcated sub leader at 3m - south      | High            | Retain<br>Prune – remove the south sub leader at 3m              |
| 29                                             | <i>Eucalyptus melliodora</i><br>Indigenous | Semi      | (3x.25)/13/5         | fair      | 5.16/2.32                    |              | High environmental values – forms part of 20 Tree block of semi mature Indigenous species                                             | High            | Retain                                                           |
| 30                                             | <i>Eucalyptus melliodora</i><br>Indigenous | Semi      | .58/17/8             | good      | 7/2.63                       |              | High environmental values – forms part of 20 Tree block of semi mature Indigenous species                                             | High            | Retain                                                           |
| 31                                             | <i>Eucalyptus</i>                          | Semi      | .47/16/8             | good      | 5.64/2.41                    |              | High environmental values –                                                                                                           | High            | Retain                                                           |

| Table One – Individual Tree Inspection Details |                                            |           |                      |           |                              |              |                                                                                                                                            |                 |                                                                                                 |
|------------------------------------------------|--------------------------------------------|-----------|----------------------|-----------|------------------------------|--------------|--------------------------------------------------------------------------------------------------------------------------------------------|-----------------|-------------------------------------------------------------------------------------------------|
| Tree No                                        | Species & Origin                           | Age Class | Dimensions D/H/C (m) | Condition | TPZ/SRZ (m radius from stem) | TPZ Impact % | Comments                                                                                                                                   | Retention Value | Recommend.                                                                                      |
|                                                | <i>meliiodora</i><br>Indigenous            |           |                      |           |                              |              | forms part of 20 Tree block of semi mature Indigenous species                                                                              |                 |                                                                                                 |
| 32                                             | <i>Eucalyptus meliiodora</i><br>Indigenous | Semi      | (2x.27)14/9          | good      | 4.6/2.25                     | 0            | High environmental values – forms part of 20 Tree block of semi mature Indigenous species                                                  | High            | Retain                                                                                          |
| 33                                             | <i>Eucalyptus meliiodora</i><br>Indigenous | Semi      | .45/17/6             | fair      | 5.4/2.37                     | 0            | High environmental values – forms part of 20 Tree block of semi mature Indigenous species<br>Bifurcated sub leader at 6m south – high risk | High            | Retain and remove sub south leader at defect                                                    |
| 34                                             | <i>Eucalyptus meliiodora</i><br>Indigenous | Semi      | (3x.3)/10/10         | fair      | 6.24/2.51                    | 0            | High environmental values – forms part of 20 Tree block of semi mature Indigenous species<br>Bifurcation in stems – higher risk            | High            | Retain and Reduce canopy by 25-30% to ameliorate defects                                        |
| 35                                             | <i>Eucalyptus meliiodora</i><br>Indigenous | Semi      | .3/15/8              | good      | 3.6/2                        | 0            | High environmental values – forms part of 20 Tree block of semi mature Indigenous species                                                  | High            | Retain – Tree now outside development boundary – but impacts still possible – see table 2       |
| 36                                             | <i>Eucalyptus meliiodora</i><br>Indigenous | Semi      | .36/10/8             | Fair      | 4.32/2.15                    | 0            | High environmental values – forms part of 20 Tree block of semi mature Indigenous species                                                  | High            | Retain – Tree now outside development boundary – but impacts still possible – see table 2Retain |



| Table Two – Details on trees with more complex requirements and general requirements. |                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                          |
|---------------------------------------------------------------------------------------|----------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|
| Tree No                                                                               | Full details, discussion and recommendations.                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                            |
| 16                                                                                    | <ul style="list-style-type: none"> <li>Proposed to place a walkway both sides of the tree stem as the main entrance to the school and footpath to front of school. Potential for very large impacts to root zone and 30-40% of TPZ.</li> <li>Tree has two bifurcations in the sub leader systems that are moderate to high risk.</li> <li>Tree is described as semi-mature – potential for notable further growth in dimensions.</li> <li><u>Recommendations</u> <ul style="list-style-type: none"> <li>Pruning required to reduce risk of limb/stem failure <ul style="list-style-type: none"> <li>Remove the sub leader on west stem at 5m – the sub leader on inside of canopy.</li> <li>Reduce the extended limbs to the west and north of the tree by 25% and lift lower canopy to allow pedestrian access.</li> </ul> </li> <li>It will be critical for the ongoing health of the tree that the root system and current soil level is not disturbed or 'sealed' to any degree. This will discount concrete pathways and similar path structures. <ul style="list-style-type: none"> <li>A permeable surface could be laid over the top of the current soil level, some small infilling or leveling with sand or road base (as sub base) under the overlay would be acceptable.</li> <li>A decking system with piers, or suspended footing structure could also be used.</li> <li>The objective is to minimize disturbance and severance to the current root system <ul style="list-style-type: none"> <li>Allow free air exchange between atmosphere and soil profile and infiltration of rainfall.</li> </ul> </li> </ul> </li> <li>The proposal for the pathway should be developed with or reviewed by arboricultural consultant if excavation is deemed required.</li> <li>Protective fencing should include this tree.</li> </ul> </li> </ul> |
| 17-36<br>(exclude 24)                                                                 | <ul style="list-style-type: none"> <li>Tree 24 (dead tree) should be removed due to failure potential.</li> <li><u>Block B - 17 semi mature trees</u> in one close stand – there is considerable scope for increase in dimensions of several the trees. The trees need space to develop canopy and root systems. There is no point placing new infrastructure near the current calculated TPZ – as this will lead to root impact issues and canopy overhang in coming years.</li> <li>As an indication - longer term TPZ of 8-10 meters could be expected.</li> <li>Proposed footpath along the front or south border proposed may impact TPZ to some trees by 10-20%.</li> <li><u>Recommendation</u> – <ul style="list-style-type: none"> <li>Sub base (road base) should be placed on top of current soil surface and compacted for footpath. Do not excavate into current soil levels inside TPZ- further site consultation may be required if excavation into TPZ is required.</li> <li><u>Block B</u> - Protective fencing should be installed around all the trees in Block B as one group taking in</li> </ul> </li> </ul>                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                        |

**Table Two – Details on trees with more complex requirements and general requirements.**

|                             | tree 16                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                  |
|-----------------------------|--------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|
| <b>General requirements</b> | <ul style="list-style-type: none"> <li>• <u>Placement of underground of Services.</u> <ul style="list-style-type: none"> <li>○ Trenching for services will be required. If trenching is inside the TPZ of any notable trees then consultation with arboricultural consultant should occur to determine impacts and remediation before trenching occurs.</li> <li>○ This is specifically noted for trees 16-36.</li> <li>○ Services reticulation will need to be assessed through design development</li> </ul> </li> <li>• <u>Block A - Western Tree Lane and Block C – East Boundary Tree lane.</u> <ul style="list-style-type: none"> <li>○ The trees identified for removal should be clearly marked and the remainder of the tree lanes can be retained as is and should be delineated from the construction site as a minimum by barrier tape and signs to prevent construction workers, materials, waste or plant/vehicles from entering the tree lane area.</li> </ul> </li> <li>• <u>Replacement vegetation.</u> The landscape plan for the site needs to include requirements to replace the lost native vegetation – specifically from Block C.</li> <li>• <u>Pruning</u> – Reduction pruning and pruning of defects can be performed in accordance with <i>Australian Standard 4373 -2007 – Pruning of amenity trees.</i></li> <li>• <u>General Tree Protection Measures</u> – All trees and retained vegetation should be fenced or delineated so that trees and the soil around the trees are protected from adverse development impacts, including storage of materials, waste, plant and vehicle parking. <ul style="list-style-type: none"> <li>○ <u>Worker Induction.</u> Site workers need to be inducted into the requirements of the tree protection zones and their importance in retaining the health of the trees.</li> <li>○ <u>Further details</u> – can be obtained from <i>Australian Standard 4970-2009 – Protection of trees on development sites</i> or contact with the author or other arboricultural consultant.</li> </ul> </li> </ul> |

**Details of Descriptors and Evaluation methods.**

**WWCC** – Wagga Wagga City Council *Development Control Plan 2010*- Part B Section 5 Natural Resource and Landscape Management

**Age Class.** N= New planting Y=Young Semi =semi mature M=Mature OM=Over mature S=Senescent D=Dead

**Dimensions** – D =Stem diameter measured at 1.4m above ground in m H=Height estimated in m. C=Canopy diameter in m.

**Condition** – Consideration of stem & canopy structure, root system, defects, form, canopy vigor, extent of any decay, pest or disease.

**TPZ/SRZ** – Tree Protection Zone specified area above and below ground and at a given distance from the trunk set aside for the protection of the tree's roots and crown to provide for the viability and stability of a tree to be retained where it is potentially subject to damage by development.

Structural Root Zone – the area around the base of a tree required for the tree's stability in the ground - calculated in meters radially from stem center. From *Australian Standard 4970-2009 Protection of Trees on development sites*

**TPZ Impact** -Percentage of encroachment into TPZ.

**Retention Value** - Very High, High, Medium, Low, Very low. Considerations – Tree Significance, Environmental and habitat values, condition, safety or hazard risk, heritage, amenity and scenic values, species performance and site condition, weed status or listed undesirable, potential for property damage.

| Environmental Rating |           | Evaluation Considerations/Criteria                                                                                                                                                                             |
|----------------------|-----------|----------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|
| 1                    | Very High | Normally Old growth Remnant Tree, multiple hollows important to endangered fauna, replacement would be well in excess of 100 years                                                                             |
| 2                    | High      | Mature or semi mature Endemic Tree with or without hollows, plays an important part in local ecology, or Australian Native that has high substitute values as endemic tree replacement would take 50-100 years |
| 3                    | Medium    | Young or semi mature Endemic tree or Australian native species that has some positive values for local fauna - replacement would take 20 or more years.                                                        |
| 4                    | Low       | Normally exotic species, or small, young endemic or native that could be replaced in the short term 5-10 years                                                                                                 |
| 5                    | Very Low  | Listed Weed or nuisance species; or very small value or insignificant to local ecology - could be replaced within 5 years or readily replaced with species of greater value                                    |

| Significant Tree values/criteria |                                                                                                                                                                                                                                                                                                                                                                                                            |
|----------------------------------|------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|
| Very Significant                 | <ul style="list-style-type: none"> <li>Defined as Significant Tree by regulatory or other authority <b>or</b></li> <li>Environmental rating 1 <b>or</b></li> <li>Heritage Listed or Very High Cultural or heritage Values</li> </ul>                                                                                                                                                                       |
| Significant                      | <ul style="list-style-type: none"> <li>Medium to large tree with Environmental value 2 <b>or</b></li> <li>Medium or larger tree in fair to excellent condition, suited to environment <b>and</b> <ul style="list-style-type: none"> <li>Imposing within the local landscape - with long life expectancy <b>or</b></li> <li>Strong amenity values or some cultural or heritage links</li> </ul> </li> </ul> |

**Terms, Conditions and Limitations that apply.**

This is a basic set of conditions and limitations that accompany a report or email (as an attachment). Obviously, visual tree assessment from the ground has some limitation as every single portion of the tree cannot be observed or inspected. Most or the large majority of defects and tree issues can be observed from the ground. Where aerial inspection or other investigative means should be considered the report or email will recommend or provide those as an additional consideration.

Trees are a valuable asset and necessary part of both the urban and natural environment. They are the cornerstone of our environment and provide numerous benefits to the biodiversity and ecology of any area. They provide water balance stability, salinity and erosion control, amenity, cultural and aesthetic benefits, efforts should be made to preserve and plant new trees where possible.

It should be noted that trees cannot be guaranteed 'risk free'. All trees represent some degree of risk. Arboriculture is not an exacting science; rather it is an educated interpretation of the interaction of biotic and environmental circumstances, which change over time. It is not possible to determine or predict all limb or tree failures. This report is such an interpretation at the time of inspection.

Unless Quantified Tree Risk Assessment (QTRA) has been specifically applied and reported, then this report or email does not constitute a risk assessment. The Author does not seek to determine what level of risk any individual or organisation is prepared to accept but serves to provide tree managers with tree condition, hazards and other salient issues associated with the tree or trees; and provide or recommend management options.



Wade Ryan  
17 October 2019  
BAppSc(EnvHort)  
AdvDip OH&S  
Cert II – Horticulture/Arboriculture  
QTRA – (Quantified Tree Risk Assessment - Registered Advance User)  
Member – ISA (International Society of Arboriculture)



Associate Member – IACA (Institute of Australian Consulting Arboriculturists)

References.

- Australian Standard (2007). Australian Standard 4373 – 2007 Pruning of amenity trees.
- Australian Standard (2009). Australian Standard 4970 – 2009 Protection of trees on development sites.
- NSW Dep. Education (2015). Tree Management Guidelines – A guide to assist with the management of trees in NSW Government Schools.
- Stelling, Fleur ed. (1998). *South West Slopes Revegetation Guide*. Murray Catchment Management Committee and Dept. Land and Water Conservation; Albury NSW.
- WWCC (2018). Wagga Wagga Development Control Plan 2010 – Part B - Section 5 – Natural Resource and Landscape Management. Tree Protection measures and Table 5.2.3 Undesirable plant species. Online 17/10/2019. Accessed at [https://wagga.nsw.gov.au/\\_data/assets/pdf\\_file/0015/112254/10.-DCP-2010-Section-5-Version-19.pdf](https://wagga.nsw.gov.au/_data/assets/pdf_file/0015/112254/10.-DCP-2010-Section-5-Version-19.pdf)

Plans Provided.

- *New PS in Wagga Wagga* – Taylor Brammer Landscape Architects, Austinmer – Trees L100 19/9/2019
- Site Plan (Undated) – *Hansen Yuncken NHQC2-WW-AR-S-001(B) SSDA Site Plan*.
- *Primary School Site Survey on part of Lot 4 in DP 1218378* (9/7/2019). Proposed Primary School site CSU Campus Estella Road Wagga Wagga NSW 2650. Michael Slinger and Associates Pty Ltd, Wagga Wagga NSW.

| <b>Appendix 1</b><br><b>Interpretation of Risk Rating Applied to Stated Defects</b>                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                               |                                        |                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                              |
|-----------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|----------------------------------------|--------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|
| Risk Rating.                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                      | Likelihood                             | Description.                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                 |
| <b>Very Low</b>                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                   | Rare – exceptional circumstances apply | All trees represent some degree of risk – <b>this is the base line</b> for a healthy tree with no known or observed defects (hazard) – large and unrestricted root space is available for root development relative to overall size of the tree. The tree and larger canopy branching structure is mechanically acclimatised to normal annual cycle of weather – the tree is expected to withstand higher level storm intensity in the Riverina of around 80-100kph winds, provided saturated soil is not encountered during such wind intensity. Small twigs and branches of 20mm diameter or less will be expected to fail in high intensity storm events. |
| <b>Low</b>                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                        | Unlikely – could occur                 | There is some small indicator or defect that removes the rating from the very low.                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                           |
| <b>Moderate</b>                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                   | Possible – Might occur                 | There is a noted or obvious defect that will normally develop further before failure. If failure was to occur at this point in time it could not be considered as completely unexpected. Such defects might fail in a high intensity storm event.                                                                                                                                                                                                                                                                                                                                                                                                            |
| <b>High</b>                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                       | Likely - Probable                      | There is an obvious defect that is expected to fail at some time. High intensity storm events typically induce some of these defects to fail. Branches or stems that have high gravitational loads on the defect are expected to fail at some point.                                                                                                                                                                                                                                                                                                                                                                                                         |
| <b>Critical (Extreme)</b>                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                         | Almost Certain                         | There is a serious defect that is impending.                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                 |
| <b>Explanatory Notes.</b> (Version date 09/05/2017) <ol style="list-style-type: none"> <li>1. Use of this interpretation of Risk Rating <u>does not</u> constitute a risk assessment or quantify actual risk of injury or damage. It provides a guide as to the likelihood of a tree or tree part (branch, stem or whole tree) failing – relative to a baseline sound tree (Very low).</li> <li>2. To conduct a risk assessment or quantify risk, the frequency of use of the area needs to be considered in the analysis. A target must be present at the time of failure; damage or injury needs to be estimated.               <ol style="list-style-type: none"> <li>a. Quantified Tree Risk Assessment (QTRA) can be applied.<br/> <a href="http://www.qtra.co.uk/cms/">http://www.qtra.co.uk/cms/</a> </li> </ol> </li> <li>3. Application of timeframes for failure are not possible to accurately predict and is therefore not stated. Even defects considered as Critical – impending – can sometimes remain intact for a number of years before failure actually occurs.</li> <li>4. Equally, the time it takes for a defect to progress towards high or critical is not able to be accurately indicated for a range of reasons and not stated. It would be considered prudent to have 'Moderate' or higher ratings to be evaluated on an agreed time basis.</li> </ol> |                                        |                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                              |