Tree Assessment & Management Plan

New Dwelling, terrace, pool, spa, carport & driveway

9 Minkara Road
Bayview

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1.0 INTRODUCTION

This Tree Assessment and Management Plan was commissioned by Steve Crosby on behalf of J Dick for the property known as Lot 40 DP 28908 9 Minkara Road Bayview.

This report is to accompany a development application to Northern Beaches Council for proposed new dwelling including terrace, pool, spa, car port, driveway and onsite wastewater management system.

The report includes:

- identification and assessment of existing trees within 5m of the proposed development, specifically existing trees with 5m of the proposed driveway;
- a photographic record of existing trees, and site conditions
- identification of trees to be removed;
- identification of trees to be retained;
- tree protection recommendations in accordance AS 4970-2009 Protection of Trees on Development Sites for trees to be retained;
- details of tree protection fencing required prior to commencement of construction works;
- recommendations for the management of existing trees to be retained; and
- recommendations for remediation works to ameliorate the impacts of soil level modifications inTree Protection Zones .

The following documentation has been reviewed in preparation of this Tree Assessment Report:

- Site Plan & Driveway details for 9 Minkara Road Bayview prepared by Steve Crosby & Associates dated August 2019;
- Landscape Plan for 9 Minkara Road Bayview prepared by CAB Consulting dated August 2019;
- Effluent management at lot 40 28908 9 Minkara Road Bayview updated 29th August 2018 prepared by Geological & Environmental Services
- AS 4970-2009 Protection of Trees on Development Sites

This report includes identification & assessment of trees within 5m of the proposed development.

2.0 PROPOSED DEVELOPMENT

The proposed development is for a new dwelling, terrace, pool, spa, carport, wastewater treatment & disposal system & driveway at 9 Minkara Road Bayview.

At the time of this assessment (August 2019) there were no existing trees located within 5m of the proposed dwelling, pool, spa, terrace and carport. The central area of the property had been cleared of vegetation.

Twelve (12) existing trees are located within 5m of the proposed driveway (location of existing gravel access track).

Three (3) existing trees (Trees 1, 14 & 15) are located within 5m of an area of recent soil level modification to the north & east of the proposed wastewater disposal area.

The development proposes the removal of one (1) existing tree.

3.0 SITE DESCRIPTION

The site is a large vacant ridgetop bushland property 21864m2 in area.

At the time of this assessment (August 2019) the central section of the site (location of proposed dwelling and wastewater disposal area) had been cleared of vegetation and contained no existing trees.

It is noted that there has been some modification to natural soil levels & construction of retaining walls within close proximity to a number of existing trees (Trees 1, 14 & 15)

In addition an existing gravel access track joins Minkara Road, there have been some minor changes to natural soil level associated with track construction. Twelve existing trees were located within 5m of the track,

The existing track is the location of the proposed driveway.

The vegetated area of the site currently supports an area of bushland vegetation, characteristic of Sydney Sandstone Woodland and Sandstone Gully Forest.

Tree canopy species include *Corymbia gummifera* (Red Bloodwood)), *Angophora costata* (Sydney Red Gum), *Syncarpia glommulifera* (Turpentine), *Eucalyptus piperita* (Sydney Peppermint) & *Allocasuarina littoralis* (She Oak).

4.0 TREE ASSESSMENT

Tree assessment is based on Visual Tree Assessment (VTA) and similar tree assessment guidelines (Dunster, Smiley, Matheny & Lilly 2013, Mattheck, 1999 and Matheny and Clark, 2004 & 1999).

Site inspection was conducted by Julia Stanton on 16th August 2019.

The vegetated area of the site currently supports an area of bushland vegetation, characteristic of Sydney Sandstone Woodland and Sandstone Gully Forest.

Tree canopy species include *Corymbia gummifera* (Red Bloodwood)), *Angophora costata* (Sydney Red Gum), *Syncarpia glommulifera* (Turpentine), *Eucalyptus piperita* (Sydney Peppermint) & *Allocasuarina littoralis* (She Oak).

The assessment includes tree identification & details of tree health & condition and identifies existing trees proposed for removal & trees to be retained.

The inspection and assessment was from ground level, no aerial or subterranean inspections were carried out. Tree heights, trunk diameter at breast height (DBH) and canopy spread were estimated.

The report includes the following information:

- botanical name, common name, diameter at breast height (DBH), height, canopy spread, tree health, form, tree defects, site conditions, Health & Condition rating* SULE rating**;
- existing trees to be removed & trees to be retained;
- recommendations of tree protection and management prior to, during and post construction; and
- a Tree Survey (Figure 1) and photographic record (Figure 2) of existing trees and site conditions.

Tree protection and management recommendations for existing trees to be retained are detailed in Section 6 of this report.

5.0 Discussion Development Impacts

At the time of this assessment there were no existing trees within 5m of the proposed dwelling, terrace, pool, spa & carport.

Twelve (12) existing trees are located within 5m of the proposed driveway and existing gravel access track.

Three (3) existing trees are located within 5m of an area of recent soil level modification (fill) to the north & east of the proposed wastewater disposal area.

The development proposes the removal of one (1) existing tree an immature specimen of *Syncarpia glomulifera* (Turpentine).

An assessment of the potential impact of the proposed development and recommendations for protection & management of trees to be retained are included.

The most common impacts of development on existing trees include:

- significant changes to natural soil levels;
- excavation and mechanical damage to existing root system;
- mechanical damage to trunk and branches;
- soil compaction or inversion of soil profile, resulting in reduced soil water and air movement;
- changes in natural hydrology, increased nutrient levels, changes to soil pH and soil contamination.

Estimating the extent of the root system of an existing tree is often used as the basis for assessing the potential adverse impact of a development on a tree. The area of significant root system (structural & feeder) that a tree relies on for survival is often calculated by the use of formulae related to the diameter of the trunk. Various terms and formulae exist to describe the area of root system that requires protection and in which development should be limited or excluded. These terms include Tree Protection Zone (TPZ) and Structural Root Zone (SRZ) or Primary Root Zone (PRZ) and Critical Root Zone (CRZ).

Calculating the area of a root system that requires protection is often used to predict the potential adverse impact of a proposed development on the root system of existing trees. It is noted that the definition and formulae for calculating the area of root system that requires protection is considered a guide in estimating the extent of the root system of a tree.

When assessing the potential adverse impact of a proposed development on an existing tree the following must be considered:

- the type and extent of development, including building envelope, services and landscaping.
- extent of excavation
- use of machinery or vehicles on site
- the area of a root system identified as requiring protection or management during development, and establishment of a (TPZ)

- an assessment of the subject tree including species, age, vigor, vitality, health and condition; and
- site and soil characteristics.

Development activity does not necessarily need to be excluded from within the identified TPZ.

Some level of development activity within an identified (TPZ) such as minor excavation, minor fill and changes to hydrological patterns are often within acceptable limits when specific tree management and protection recommendations and construction techniques are adopted.

Impact of on-site wastewater disposal
Potential adverse impacts of on-site effluent treatment and disposal on existing trees and vegetation include:

- Excavation for tanks and trenches and subsequent damage to structural and or feeder roots of existing trees;
- Mixing of or inversion of soil profiles (topsoil and subsoil) and subsequent alteration to water infiltration rates through the soil profile;
- Changes to natural soil moisture levels and natural hydrological patterns
- Increase in soil nutrient levels specifically, Phosphorus, Nitrogen, Boron and Sodium;
- Possible changes to soil pH;
- Decline in the health of over mature trees and or trees in decline which are less able to adapt to changes in environmental conditions;
- Excessive removal of indigenous shrub and ground cover vegetation;
- Creation of environmental conditions which favour weed germination and growth;

The potential adverse impact of on-site effluent disposal systems on existing trees and vegetation can generally be minimized to acceptable limits through sensitive design and location of effluent treatment systems and disposal areas and the development of vegetation protection and management recommendations, specifically:

- Locating effluent disposal fields/ trenches in areas of the site where suitable land application requirements and boundary and dwelling offsets are achieved with least impact on existing significant trees and vegetation;
- Hand excavation of wastewater disposal trenches within 5m of existing trees to be retained.
- Increased nutrient levels can be further reduced through wastewater management and the use of low Sodium, Boron and Phosphorus cleaning and washing products:
- Damage to structural and feeder roots in the identified TPZ of trees can be minimized by conducting all excavation within 5m by hand and by avoiding damage to structural roots over 50mm in diameter;
- Implementing a program of weed control in bushland vegetation adjacent to wastewater disposal areas.

5.1 Potential impact of the proposed development on existing trees.

Refer to appendix Table 1 for Tree Assessment & Identification details & documentation.

Trees to be removed to accommodate proposed development

One (1) existing tree (Tree13) is located within the building envelope for the proposed driveway & has been identified for removal.

Tree 13 is an immature specimen of *syncarpia glommulifera* (Turpeptine) in good health and fair condition.

There are no additional trees proposed for removal.

Trees within 5m of the proposed driveway to be retained

Twelve (12) existing trees (Trees 1, 2, 3, 4, 5, 6, 7, 8, 9, 10, 11 & 12) are located within 5m of the proposed driveway and are to be protected and retained.

Tree 5 is a dead tree

Trees 8 & 11 are mature specimens of *Eucalyptus pipertia* (Sydney Peppermint) in poor – fair health and condition and contain numerous cavities and hollows. These trees are nominated for retention as habitat trees.

Nine (9) existing trees to be retained and are to be protected in accordance with AS 4970-2009 Protection of trees on development sites.

Natural soil levels are to be re-established and/or maintained between trees to be retained and the proposed new driveway.

In addition remediation works to ameliorate the impact of recent soil level changes and construction of retaining walls is to be undertaken within 5m of Trees 1, 9, 14 & 15.

Removal of fill & sandstone retaining walls to re-establish natural soil levels is to be undertaken sensitively to avoid soil compaction & prevent disturbance to the natural soil profile.

To ensure adequate protection during construction tree protective zones (TPZ) are to be established with protective fencing prior to commencement of works.

6.0 Recommendations

Tree protection and management recommendations have been included to minimize the potential adverse impacts of the proposed development on existing trees to be retained.

- To ensure adequate protection during construction tree protective zones (TPZ) are to be established with protective fencing prior to commencement of works. Tree protective fencing must be adequate to protect all existing trees to be retained from the adverse impact of construction activity. Tree protection measures must be suitable to adequately protect trees and vegetation including trunks, branches, roots and soil. Tree / trunk / soil protective fencing is to be in place prior to commencement of site works and is to be maintained for the duration of construction works.
- Excavated soil is not to be disposed of or stored within 5m of existing trees, (unless works are part of the approved development).
- Natural soil levels are to be re-established and/or maintained between trees to be retained and the proposed new driveway (Trees 2, 3, 4, 6, 7, 8, 9, 10, 11 & 12).
- Remediation works to ameliorate the impact of recent soil level changes and construction of retaining walls is to be undertaken within 5m of Trees 1, 9, 14 & 15.
- Removal of fill & sandstone retaining walls to re-establish natural soil levels is to be undertaken sensitively to avoid soil compaction & prevent disturbance to the natural soil profile.
- Trees 8 & 11 are mature specimens of *Eucalyptus pipertia* (Sydney Peppermint) in poor – fair health and condition and contain numerous cavities and hollows. These trees are nominated for retention as habitat trees.
- To prevent soil compaction within the root zone of existing trees all vehicles and machinery are to be excluded from within designated tree protection areas of existing trees to be retained.
- If machinery access is unavoidable measures must be implemented to minimize soil compaction such as avoiding machinery movement during periods following rain when soil is saturated, the application of 100mm of mulch or similar covered by a layer ply board or similar.
- In the event that significant structural roots (roots greater than 50mm) are encountered, during excavation, and cutting the roots cannot be avoided, the project arborist is to assess and report on the likely impact of damage to the roots on the health and structural stability of the tree.
- There **must be no additional changes to** existing soil levels other than excavation / fill detailed as a part of this proposed development.
- Materials and stock piled subsoil and topsoil are be stored in designated storage area only.
- No construction waste such as excavated soil, concrete, mortar, paint etc. is to be disposed of within, designated tree protection areas.
- Crown maintenance pruning (removal of dead, diseased & defective branches) is recommended for all trees to be retained.
- Planting of three replacement specimens of *Syncapia glomulifera* (Turpentine) in a suitable location on the property is recommended.

7.0 CONCLUSIONS

The proposed development is for a new dwelling, terrace, pool, spa, carport, wastewater treatment & disposal system & driveway at 9 Minkara Road Bayview.

The site is a large vacant ridgetop bushland property 21864m2 in area.

At the time of this assessment (August 2019) there were no existing trees located within 5m of the proposed dwelling, pool, spa, terrace and carport. This central section of the site has been previously cleared of vegetation.

Twelve (12) existing trees are located within 5m of the proposed driveway (location of an existing gravel access track).

The development proposes the removal of one (1) existing tree an immature specimen of *Syncarpia glomulifera* (Turpentine).

It is noted that there has been some modification to natural soil levels & construction of retaining walls within close proximity to a number of existing trees (Trees 1, 14 & 15)

Remediation works to ameliorate the impact of recent soil level changes and construction of retaining walls is to be undertaken within 5m of Trees 1,14 & 15. Removal of fill & sandstone retaining walls to re-establish natural soil levels is to be undertaken sensitively to avoid soil compaction & prevent disturbance to the natural soil profile.

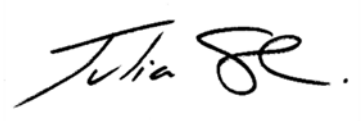
In addition an existing gravel access track joins Minkara Road, there have been some minor changes to natural soil level associated with track construction. Twelve existing trees were located within 5m of the track.

The existing track is the location of the proposed driveway.

To minimise the impact of soil level changes associated with track & driveway construction natural soil levels are to be re-established and/or maintained between trees to be retained and the proposed new driveway (Trees 2, 3, 4, 6, 7, 8, 9, 10, 11 & 12).

Trees 8 & 11 are mature specimens of *Eucalyptus pipertia* (Sydney Peppermint) in poor – fair health and condition and are nominated for retention as habitat trees.

Specific protection and management recommendations detailed in Sections 6 of this report are to be adopted & implemented.



Julia Stanton B.Sc. (Environmental and Urban Horticulture) 26th August 2019
Arborist/Environmental Horticulturalist

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Table 1 Existing Trees within 5m of proposed development 9 Minkara Road Bayview

Tree No.	Botanical Name	Common Name	Age	Hgt m	Av. Can	DBH DGL	Health	Condition	Site Condition	Comments	Sule	H&C rate	Hazard rating
1	*Angophora costata*	Sydney Red Gum	M	16	15m	480 550 1100	Good Vigorous foliage in crown	Fair - Good Lower trunk scar	Remnant indigenous tree, recent area of fill and rock retaining wall within 5m	**Retain & protect** Proposed sandstone boulders on edge of wastewater disposal field at 5m from this tree. Wastewater disposal field located outside calculated SRZ. Remediation works within 5m required, Remediation works is to be undertaken within 5m. Removal of fill & sandstone retaining walls to reestablish natural soil level. Remediation works is to be undertaken sensitively to avoid soil compaction & prevent disturbance to the natural soil profile. Tree protection fencing to be established prior to commencement of construction works.	2a	3-4	Low

Tree No.	Botanical Name	Common Name	Age	Hgt m	Av. Can	DBH DGL	Health	Condition	Site Condition	Comments	Sule	H&C rate	Hazard rating
2	*Angophora costata*	Sydney Red Gum	M	18	12m	600 640	Good .	Fair – good Lower trunk damage Good form	Remnant indigenous tree located adjacent to existing gravel track Minor area of sandstone fill within calculated SRZ	**Retain & protect** Located 2m from proposed concrete driveway. Driveway within calculated SRZ. Impact of driveway is expected to be minimal with no major changes to existing soil levels. In addition remediation works are to be undertaken between proposed concrete driveway and trunk. Remove area of fill to reestablish natural soil level. Remediation works is to be undertaken sensitively to avoid soil compaction & prevent disturbance to the natural soil profile. Tree protection fencing to be established prior to commencement of construction works. .	2a	4	Low

Tree No.	Botanical Name	Common Name	Age	Hgt m	Av. Can	DBH DBL	Health	Condition	Site Condition	Comments	Sule	H&C rate	Hazard rating
3	*Angophora costata*	Sydney Red Gum	M	17	13m	450 480	Good	Good Good form	Remnant indigenous tree. Located 1m above existing track, exposed sandstone rocks	**Retain & protect** Located 1m above level of proposed driveway. Driveway located within calculated SRZ however impact on the root zone is likely to be minimal as tree is naturally separated from proposed driveway topographically and physically by exposed sandstone rocks. Tree protection fencing to be established prior to commencement of construction works.	1a	4	Low
4	*Angophora costata*	Sydney Red Gum	Sm	14	6m	280 300	Good	Good Deadwood to 100mm	Remnant indigenous tree. Located 2m from existing gravel track.	**Retain & protect** Located 2m from proposed driveway outside calculated SRZ, minimal changes to natural soil levels proposed. Tree protection fencing to be established prior to commencement of construction works.	1a	4	Low

Tree No.	Botanical Name	Common Name	Age	Hgt m	Av. Can	DBH DBL	Health	Condition	Site Condition	Comments	Sule	H&C rate	Hazard rating
5	Dead	Dead											
6	*Syncarpia glommulifera*	Turpentine	Sm	10	5m	200 300 500	Good Typical of species	Fair – good Lower trunk scar with good wound wood development	Remnant indigenous tree	**Retain & protect** Located 5m from proposed driveway outside calculated SRZ. Reestablish & maintain natural soil level between proposed driveway & trunk. Remediation works is to be undertaken sensitively to avoid soil compaction & prevent disturbance to the natural soil profile. Tree protection fencing to be established prior to commencement of construction works.	2a	4	Low
7	*Syncarpia glommulifera* (Clump)	Turpentine	Sm	8	5m	200 180 200 200	Good	Fair – Good Basal trunk scar on one trunk	Remnant indigenous trees	**Retain & protect** Located 3m from proposed driveway outside calculated SRZ. Maintain natural soil level between proposed driveway & trunk. Tree protection fencing to be established prior to commencement of construction works.	1a	4	Low

Tree No.	Botanical Name	Common Name	Age	Hgt m	Av. Can	DBH DBL	Health	Condition	Site Condition	Comments	Sule	H&C rate	Hazard rating
8	*Eucalyptus piperita*	Sydney Peppermint	OM	10	4m	600	Poor Sparse foliage Evidence of previous fire damage	Poor Large basal trunk scar with numerous cavities	Remnant indigenous tree located adjacent to existing track	**Retain as habitat tree** **In poor health & condition 1.75m proposed driveway.** **Retain as habitat tree** .	4h	2	Medium
9	*Angophora costata*	Sydney Red Gum	M	17	12m	1m 1.3	Fair - good	Fair – Good Co dominant @ 2m	Remnant indigenous tree Some evidence of soil disturbance within root zone	**Retain & protect** Located 4m proposed driveway outside calculated SRZ. Reestablish & maintain natural soil level between proposed driveway & trunk. Remediation works is to be undertaken sensitively to avoid soil compaction & prevent disturbance to the natural soil profile. Tree protection fencing to be established prior to commencement of construction works.	2a	4	Low

Tree No.	Botanical Name	Common Name	Age	Hgt m	Av. Can	DBH DBL	Health	Condition	Site Condition	Comments	Sule	H&C rate	Hazard rating
10	*Syncarpia glomulifera*	Turpentine	Sm	10	5	320	Good Typical of species	Good Typical of species	Remnant indigenous tree Adjacent to existing access track.	**Retain & protect** Located 2m from proposed driveway outside calculated SRZ. Reestablish & maintain natural soil level between proposed driveway & trunk. Remediation works is to be undertaken sensitively to avoid soil compaction & prevent disturbance to the natural soil profile. Tree protection fencing to be established prior to commencement of construction works.			
11	*Eucalyptus pipertia*	Sydne Peppermint	M	12	5	650	Poor - fair Sparse foliage in crown	Poor – Fair Evidence of fire damage Habitat hollows	Remnant indigenous tree Adjacent to access track	**Retain as habitat tree** **In poor – fair health & condition 2.25m proposed driveway. Retained as habitat tree**	4h	2	Medium

Tree No.	Botanical Name	Common Name	Age	Hgt m	Av. Can	DBH DBL	Health	Condition	Site Condition	Comments	Sule	H&C rate	Hazard rating
12	*Syncarpia glomulifera*	Turpentine	M	16	7m	180 600 700	Good health Vigorous foliage in crown	Fair condition Large basal cavity with good wound wood development.	Remnant indigenous tree 3.5m from existing access track	**Retain & protect** Located 5m from proposed driveway outside calculated SRZ. Reestablish & maintain natural soil level between proposed driveway & trunk. Remediation works is to be undertaken sensitively to avoid soil compaction & prevent disturbance to the natural soil profile. Tree protection fencing to be established prior to commencement of construction works.	2a	4	Low
13	*Syncarpia glomulifera*	Turpentine	Im	8	2m	160	Good health	Fair 4m trunk scar	Remnant indigenous tree Located adjacent to power lines	**Remove to accommodate proposed driveway** **Replacement planting in suitable location on property.**	5b	3-4	Low

Notes

Hgt = Height in metres, Age = Age Class, Av Can = Average Canopy Spread in metres, DBH = Diameter @ breast height (1.5m) in millimetres

I = Immature, Sm = Semi-mature, M = Mature, Om = over-mature

Table 2 Existing trees more than 5m from the proposed development to be retained & protected

Tree No.	Botanical Name	Common Name	Age	Hgt m	Av. Can	DBH DGL	Health	Condition	Site Condition	Comments	Sule	H&C rate	Hazard rating
14	*Corymbia gummifera*	Red Bloodwood	Sm	14	6m	400 430	Good Vigorous foliage in crown	Fair - Good Dieback of scaffold branch good wound wood development	Remnant indigenous tree, recent area of fill and rock retaining wall within 5m	**Retain & protect** Remediation works within 5m required, Remediation works is to be undertaken within 5m. Removal of fill & sandstone retaining walls to reestablish natural soil level. Remediation works is to be undertaken sensitively to avoid soil compaction & prevent disturbance to the natural soil profile. Tree protection fencing to be established prior to commencement of construction works.	2a	3-4	Low

Tree No.	Botanical Name	Common Name	Age	Hgt m	Av. Can	DBH DGL	Health	Condition	Site Condition	Comments	Sule	H&C rate	Hazard rating
15	*Corymbia gummifera*	Red Bloodwood	Sm	13	8m	600 640	Good .Typical of species	Good Typical of species	Remnant indigenous tree Area of sandstone fill within calculated TPZ	**Retain & protect** Remediation works within 5m required, Remediation works is to be undertaken within 5m. Removal of fill & sandstone retaining walls to reestablish natural soil level. Remediation works is to be undertaken sensitively to avoid soil compaction & prevent disturbance to the natural soil profile. Tree protection fencing to be established prior to commencement of construction works. .	2a	4	Low
16	*Angophora costata*	Sydney Red Gum	M	12	12m	500 550	Good	Good Good form	Remnant indigenous tree. No evidence of disturbance within 5m	**Retain & protect** **More than 5m from proposed development.** Tree protection fencing to be established prior to commencement of construction works.	1a	4	Low

NOTES

Hgt = Height in metres, Age = Age Class, Av Can = Average Canopy Spread in metres
DBH = Diameter @ breast height (1.5m) in millimetres

Age classess (I) *immature* refers to a well established but juvenile tree. (S) Semi-mature refers to a tree at growth stages between immaturity and full size. (M) *Mature* refers to a full sized tree with some capacity for further growth. (O) *Overmature* refers to a tree about to enter decline or already declining.
Health refers to the tree's vigour as exhibited by the crown density, leaf colour, presence of epicormic shoots, ability to withstand disease invasion and the degree of dieback.
Condition refers to the tree's form & growth habit, as modified by its environment. And includes the state of the scaffold (ie trunk and major branches), including structural defects such as cavities, crooked trunks or weak trunk/branch junctions (inclusions) and condition of the root system . These are not directly connected with health and it is possible for a tree to be healthy but in poor condition.

Adapted from Matheny and Clark (1999) Conducting a Resource Evaluation, from *Care and Management of Trees on Development Sites Proceedings of the 2nd NAAA Tree Management Seminar and Workshop.*

*** H & C (Heath & Condition) rating -** summary of the health and structure of the tree on a scale of 0 - 5

5 A healthy vigorous tree, little if any signs / symptoms of disease or stress with good structure and form typical of the species

4 Trees with some evidence of decline in vigour, minor twig die back, small amount of dead wood, good form and structure.

3 A tree with only moderate vigour, presence of moderate amounts of twig die back and dead wood, crown may be thinning, moderate form, or a tree with some branch or trunk damage but canopy/ foliage cover good, or a tree with good overall condition, but poor form.

2 A tree in a state of decline, large amount of twig die back or epicormic growth, dieback of medium to large branches, cause of decline cannot be rectified or alleviated. Or a tree with significant structural defects (inclusions, root girdling, and cavities) which cannot be rectified or satisfactorily remediated.

1 A tree in serve decline, die back of dominant branches or trunk, large amounts of twig die back or the majority of foliage epicormic. Cause of decline cannot be rectified or alleviated. Or a tree with significant structural defects (inclusions, root girdling, and cavities) which cannot be rectified or remediated.
0 Dead tree

****SULE categories (Barrell.**
Safe Useful Life Expectancy Categories (Updated 01/04/01) Barrell (2001)

1: Long SULE: Trees that appeared to be retainable at the time of assessment for more than 40 years with an acceptable level of risk.
{a) Structurally sound trees located in positions that can accommodate future growth.
(b) Trees that could be made suitable for retention in the long term by remedial care.
(c) Trees of special significance for historical, commemorative or rarity reasons that would warrant extraordinary efforts to secure their long-term retention.

2: **Medium SULE: Trees that appeared to be retainable at the time of assessment for 15-40 years with an acceptable level of risk.**
(a) Trees that may only live between 15 and 40 more years.
(b) Trees that could live for more than 40 years but may be removed for safety or nuisance reasons.
(c) Trees that could live for more than 40 years but may be removed to prevent interference with more suitable individuals or to provide space for new planting.
(d) Trees that could be made suitable for retention in the medium term by remedial tree care.

3: Short SULE: Trees that appeared to be retainable at the time of assessment for 5-15 years with an acceptable level of risk.
(a) Trees that may only live between 5 and 15 more years.
(b) Trees that could live for more than 15 years but may be removed for safety or nuisance reasons.
(c) Trees that could live for more than 15 years but may be removed to prevent interference with more suitable individuals or to provide space for new planting.
(d) Trees that require substantial remedial tree care and are only suitable for retention in the short term.

4: Remove: Trees that should be removed within the next 5 years.
(a) Dead, dying, suppressed or declining trees because of disease or inhospitable conditions.
(b) Dangerous trees because of instability or recent loss of adjacent trees.
(c) Dangerous trees because of structural defects including cavities, decay, included bark, wounds or poor form.
(d) Damaged trees that are clearly not safe to retain.
(e) Trees that could live for more than 5 years but may be removed to prevent interference with more suitable individuals or to provide space for new planting.
(f) Trees that are damaging or may cause damage to existing structures within 5 years.
(g) Trees that will become dangerous after removal of other trees for the reasons given in **(a) to (t).**
(h) Trees in categories (a) to (g) that have a high wildlife habitat value and, with appropriate treatment, could be retained subject to regular review.

5: Small, young or regularly pruned: Trees that can be reliably moved or replaced.
(a) Small trees less than 5m in height.
(b) Young trees less than 15 years old but over 5m in height.
(c) Formal hedges and trees intended for regular pruning to artificially control growth.

DEFINITIONS (From Tree Risk Assessment Manual ISA (2013), Australian Standard *Protection of Trees on Development Sites* 2009 Australian Standards AS 4373 – 2007 Pruning of Amenity Trees, Matheny and Clark, 1994 and 2004)

Co-dominant stems – stems or trunks of about the same size originating from the same position from the main stem. When the stem bark ridge is turned upwards the union is strong, when the ridge turns inwards the union is weak.

Critical Root Zone (CRZ) – an offset 5 x the trunk diameter of a tree. Within this area significant structural roots are usually encountered. Elevated construction may be possible within this area, subject to an assessment of the subject tree including age, vigor, health and condition and root zone assessment. Specific tree management and protection recommendations and construction techniques required.

C & PRZ – **Critical and Primary root zone -** The definition and formulae for calculating the C & PRZ of a tree is to be considered only a guide to determine the extent of a trees root system. The C & PRZ calculation should be used in conjunction with an assessment of the subject tree including age, vigor, health and condition, site and soil characteristics and root zone assessment, when assessing the potential adverse impact of a proposed development on a tree.

Crown lifting – the removal of the lowest branches.

Crown Thinning – General pruning with the additional removal of secondary branches whist retaining the main structural branches of the tree.

Crown Maintenance General – pruning which consists of removal of dead, diseased, dying, defective and conflicting branches.

Deadwooding – removal of deadwood

DGL- Trunk diameter at ground level

Endemic – having a natural distribution confined to a particular geographic region.

Hazard- situation or condition that is likely to lead to a loss, personal injury property damage, a likely source of harm.

Hazard abatement- Reduction in the likelihood that failure of a tree or a part will result in injury to people or damage to property.

Indigenous – native to the area not introduced

Locally native flora and fauna – plants and animals that are native in Pittwater at any stage of life cycle

Lopping- random cutting of branches or stems between branch union or internodes. This is an unacceptable practice.

Primary Root Zone (PRZ) – an offset 10 x the trunk diameter of a tree. Within this area significant feeder roots area usually encountered. Excavation and fill may possible within this area, subject to an assessment of the subject tree including age, vigor, health and condition and root zone assessment. Specific tree management and protection recommendations and construction techniques required.

Risk – The combination of the likelihood of tree failure and severity of the potential consequences. The likelihood of tree failure occurring and affecting a target and severity of the consequences.

Selective pruning – The removal of identified branches that are causing a specific problem. These branches shall be specified.

Senescence – The process of aging and death.

Significant Trees - trees that contribute substantially, either individually or as a component of a tree group to the landscape character, amenity, cultural values or biodiversity of their locality.

Structural Root Zone (SRZ) The portion of the root plate comprised primarily of structural woody roots (integral with the soil profile) providing the main mechanical support and anchorage of a tree, calculated in accordance with AS 4970:2009, expressed as a radial dimension in metres from the centre of the trunk.

Target – People or property potentially affected by tree failure

Tree Protection Zone (TPZ) - A specified area at a given distance from the trunk set aside for the protection of a trees root system and canopy during land development works to ensure that a tree remains viable.
Radius of the TPZ is calculated by multiplying the DBH x 12. The TPZ incorporates the SRZ.