**Consulting Arborist's Report**

# Tree Evaluation Report

## For: Terraces in Murrieta

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Dated: 1/11/2022

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# Introduction

## Background

Greystar Homes is planning to build an apartment complex on the properties running between the I-15 Freeway and Murrieta Hot Springs Road, from the corner of Sparkman Drive and Vista Murrieta south to its end near I-15. The properties there now have a mixture of old and young trees in various conditions and health status. Greystar and City of Murrieta would like to save as many existing trees as is safe and reasonable. However, to properly grade, prepare the site, and build the apartments will require the removal of nearly all trees. Most of the existing trees are concentrated at the southeast corner in and near a drainage outflow.

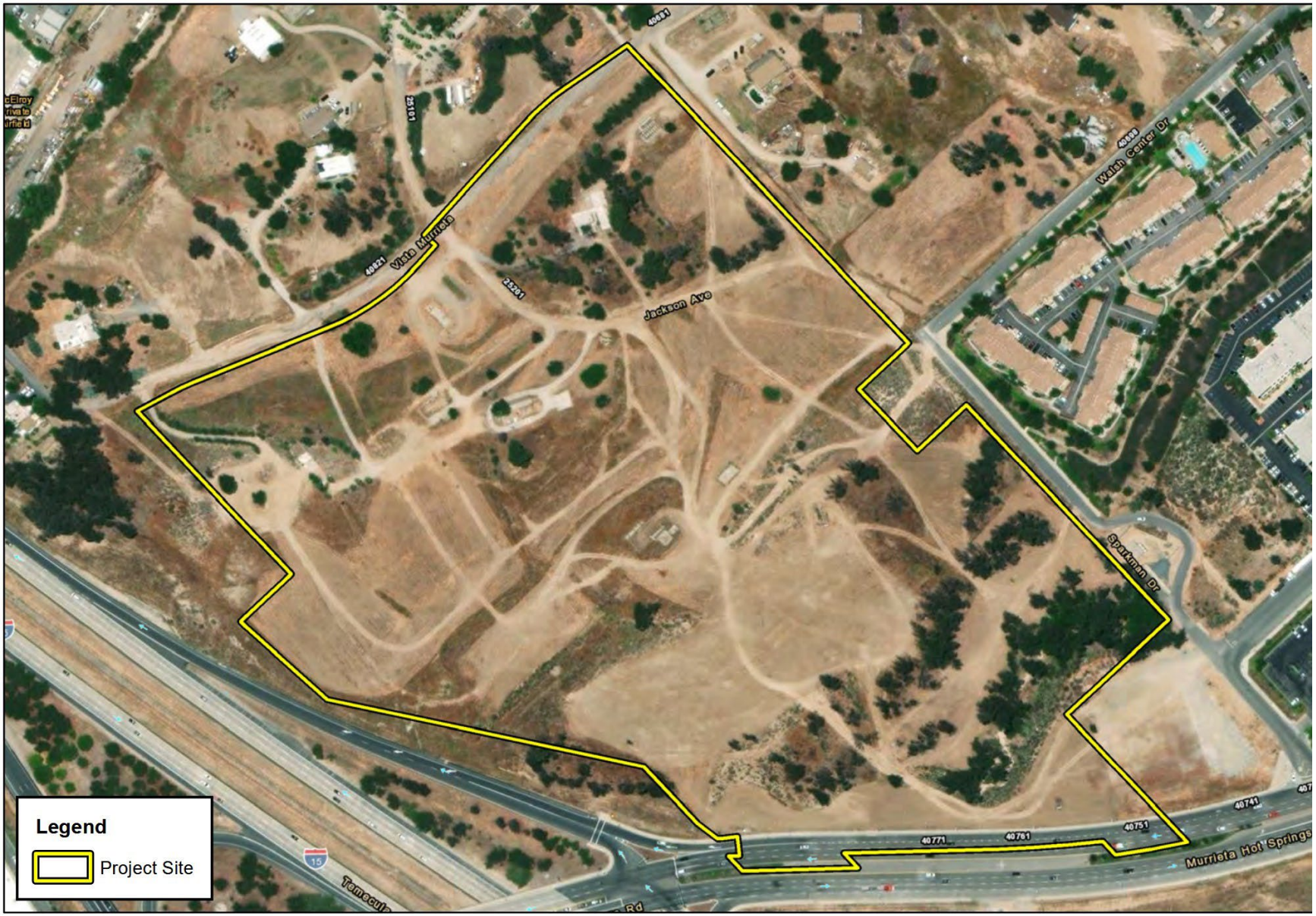
This consultant inspected, measured the trees and took photographs of site trees during the week of January 3, 2022. Few protected trees were found. A total of 293 trees were tagged, measured, evaluated and included herein.

## Assignment

Mr. Adam Covington, of Greystar Homes, contacted this consultant and requested that I prepare a proposal to provide an arboricultural evaluation of 200 trees' health and condition, professional opinions, and report for the City of Murrieta, per Section 16.42.080 of the Muni. Code. All protected trees 4" caliper or larger and all other trees 9.5" caliper or larger, will be tagged, measured, evaluated and included. Representative photographs are included to aid understanding.

# Site Map

The trees in area outlined in yellow are the scope of this report.



# Summary

The trees are not individually mapped by this consultant. A general map is provided to show surveyors the approximate locations of the trees I inspected. Per City reporting requirements and the scope of work, all the trees with 9.5" caliper and above were inspected and are listed here. Native trees over 4" caliper were also inspected.

The City of Murrieta protects mature native oak trees; other mature native trees; mature trees; historically significant trees; and any tree required to be planted or preserved as environmental mitigation. There are no mature native oaks or mature other California native trees, except native willows near the outflow. A few Freemont cottonwoods, one white alder, and one Mexican elderberry were also found, but all but one were in poor condition. In the upper part of the outflow, near the drain pipe, the willows are crowded, broken and fallen. They are mixed mostly with red gum eucalypts. Unfortunately, there are overhead power lines and the trees below were brutally topped. The outflow area need not be disturbed by the new project.

Other portions of the site are very dry and the vast majority of trees are pines and other drought tolerant species, like California peppers. There are a number of beautiful large trees, but beautiful only from a distance. If they have been pruned, and very few have, it was to their detriment. Generally, pruning and maintenance of these trees has been non-existent or below average compared to landscape standards. Near the former home sites, along the northwest edge, there is more of a range of species that were planted. Receiving no care or irrigation for many years has killed many, left others in very poor health and many are broken. Other than a few in low spots, only the most drought tolerant have survived.

Even the Mexican fan palms have not survived well, the foliage is stunted, yellow, and dead fronds cover the trunks to ground level. The California peppers have a fairly nice canopy of foliage, but their structures are a tangled mess. The Aleppo pines are barely surviving, but most are leaning, codominant with included bark, and dead tops. The row of Afghan pines are very sparse, crowded and one-sided. Some California peppers are attractive, but their low-branching structure would be hard to use in among apartment buildings.

Cars and trucks have been driven and parked all over most of these residential properties. This makes for compacted soil. Compacted soil causes shallow rooted or unhealthy trees. This may partly explain the large number of fallen trees.

This consultant is aware that construction and vast changes to the site are planned, but is not aware of all the specifics. Consider though, that when buildings are built, trenches are dug for utilities, or new paving installed near existing mature trees, very few trees could be saved and most would not be worth it. Plans are to grade almost the entire site, except around the outflow. See the Current Site Plan on page 5.

No or very few trees can be saved. In the recommendations chapter of this report, individual clearances for preservation are not provided. The basics of the City's requirements are discussed, so that if the City or developers think they can or want to save certain trees, guidelines for determining necessary clearance is provided. This consultant sees little to no chance that a worthwhile tree from this property can be left in a suitable place and have the ability and space to continue growing for any length of time, except in the outflow area. No trees are recommended for transplanting, storage and replanting. If there are any trees that are considered for preservation, the recommended clearance guidelines are developed to keep an acceptable loss rate, but there will still be many related stress factors to survive as construction proceeds.

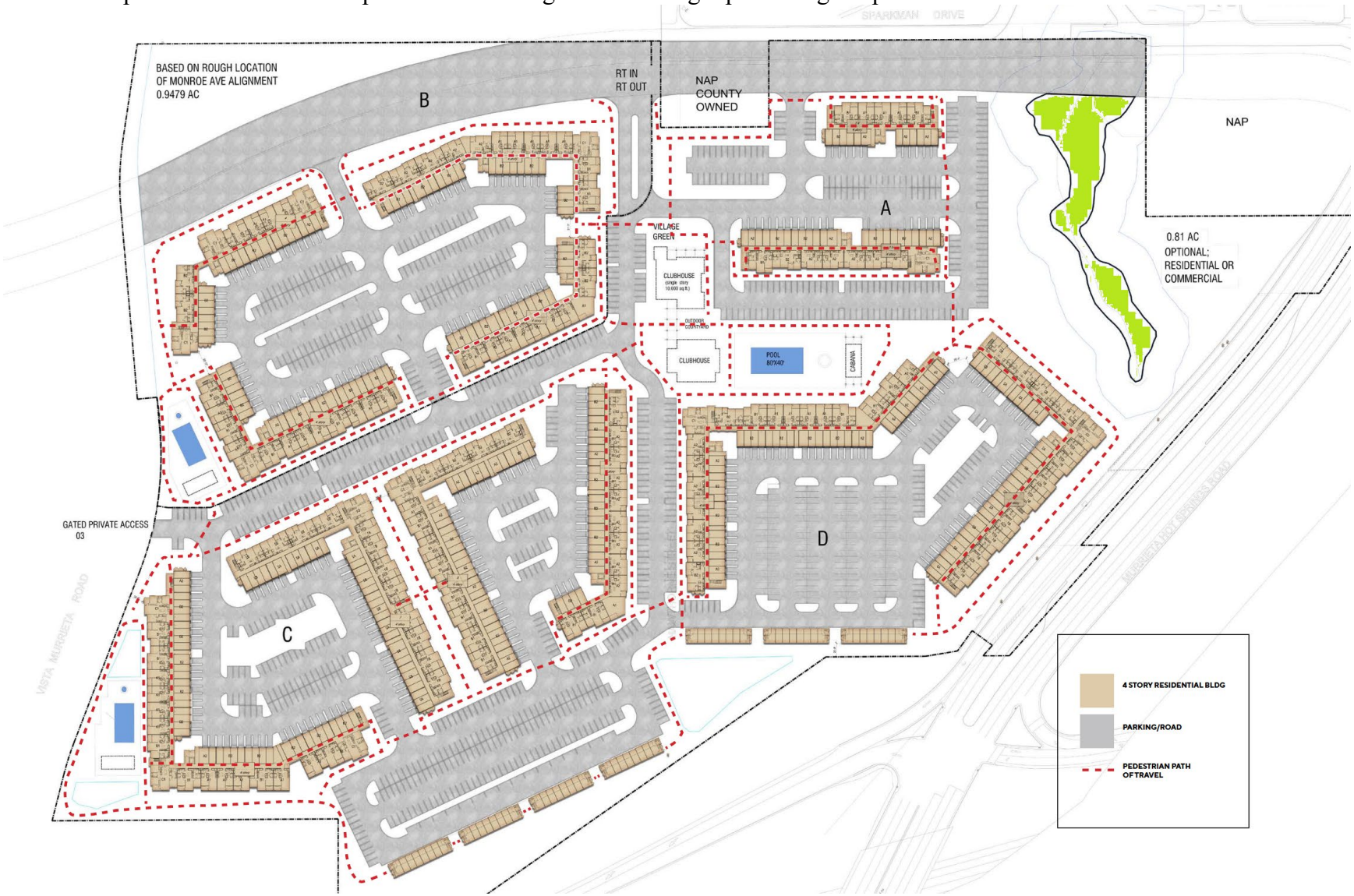
If after surviving construction there are still live standing trees, they need to be inspected again. If trenches have been dug nearby and roots have been cut, the trees should be inspected again. Changes are often made during construction, and if a trench was dug too close and filled in and forgotten, who would remember? No one would want to leave hazardous trees behind for the future residents. Consider that prior to my inspection, many trees on site already had past failures, injuries and stress factors.

Protecting trees during construction requires good fencing, more than orange plastic fencing, to protect their root zones from compaction, trenching and pollution. On a large construction site with giant grading machines racing around, accidents can still happen. After construction, more damage is likely. A level 2 risk inspection, per ANSI A300, part 9 is necessary for trees kept for the new land use. Trees that are disclosed to possibly be high risk, may need a level 3 inspection for additional study.

A number of these trees are about 100 feet tall. Planning for the survival of large trees will require protecting them and providing ample space for ever increasing root space needs. If, after construction, the remaining protected trees had too many roots cut, they will decline and die over the following years. This can take years and the trees may look terrible over that time. If even more roots were cut, they may topple suddenly during a storm or Santa Ana wind. It is hard to predict the wind tunnels that will be created between apartment buildings. The clearances are minimums and more is always better. Long term growth and health requires more and more space. Good root and soil protection will be needed from here on, especially during landscaping when trenching for irrigation may cut additional roots. Supervision of the work around the trees through the whole process is essential.

# Current Site Plan

The plan below is what was provided to Arborgate Consulting representing the plans for the site/



# Observations

## General Findings

There are two groups of trees on this site. The dense grove of trees in the outflow area, (#1-97) near Murrieta Hot Springs Road and Sparkman, and the other trees, mostly near the former residences along Vista Murrieta. The trees in the immediate outflow area, delineated on page 5, will not be impacted. The rest of the site will be graded and prepared for construction of apartment buildings.

The Terraces in Murrieta will be located just off the I-15 Freeway at Murrieta Hot Springs Road. The site has various conditions, some large slopes and grade changes. Most of the site soil is compacted due to decades of foot, equipment and vehicle traffic. This soil compaction causes trees to be shallow rooted.

The outflow area is included in this report, but since it is not impacted by this project, little mention will be made of tree conditions there, except to say that a great many trees have fallen, died or broken. There are enough broken and fallen trees and tree parts that storm water flow though this area is likely to be impacted. General photographs are included later in this report. This is where nearly all the native riparian trees are located. Twenty-six of the 98 trees in this area are native willows. The south end of the outflow is fairly dry and the last 35 trees are red gums. Fallen trees are included in the matrix, if they are still living.

The other parts of this site make up almost 90 percent of the area. The first portion of the site, just west of the outflow area is moderately sloped. All the trees in this area are a southeast facing slope. All one hundred of them are red gums, Eucalyptus

camaldulensis. They range in size, with the dominant ones up to about four feet in trunk diameter, some about 100 feet tall. Trees in this area are more sparse than normal irrigated trees. Red gums in Australia are considered riparian trees, so the survival of these is somewhat surprising. The fact that they have also survived past redgum lerp psyllid infestations, is even more surprising. Currently the tortoise beetles are eating much of the eucalypts' foliage all over the site.

The middle section is almost devoid of trees. This section runs from what would be the extension of Walsh Center Drive to the back yards of the residential properties along Vista Murrieta. Trees in this area include one Mexican elderberry, Sambucus mexicana; a large Aleppo pine, Pinus halepensis; a struggling Fremont cottonwood, Populus fremontii, well out of its natural setting; a surprisingly healthy Mexican fan palm, Washingtonia robusta; and a healthy California pepper, Schinus molle.

The northwest edge of the site was formerly all residential properties. These properties slope down on both sides, with entries toward Vista Murrieta to the northwest, and the empty mid-section to the southeast in back. Most of the trees are eucalypts or pines. The eucalypts are mostly red gums and flooded gum, E. rudis, a closely related species or subspecies. Most of the pines are Aleppo pines or Afghan pines, Pinus eldarica. Other species are scattered odd species, usually less than three of a kind, except there is a group of struggling Mexican fan palms at the far west end. Most of these palms were not tagged and included, because their skirt of dead fronds runs all the way to the ground, so there was no place to attach the tags.

For many trees, crowding has caused unbalanced, one-sided growth as they reach for sunlight around their neighbor, e.g. eucalypts on both ends of the site, and the row of Afghan pines at the north corner of the site. Such trees have crowded and intertwined roots, which can also be a benefit, aiding their wind tolerance and sharing water and nutrients. Crossing and crowded limbs have not been pruned out. Excessively long limbs have not been shortened. There has been no subordination of codominant limbs. Several trees have large amounts of included bark in the branch crotches, making for weak branch attachments. Sprouts (epicormic shoots) indicate recovery after insect attack, other relieved stress, over-pruning or heading. Sprouts are weakly attached as well, but can be spaced and reduced to correct this condition. Such crown restoration pruning can take several years of a coordinated plan. (unlikely as it is)

The larger specimen trees (<18" DSH) including peppers, Aleppo pines, and eucalypts are structurally weak, mostly due to codominant stems, included bark, and overly long limbs. Considering almost no care, these conditions could be expected. These conditions have led to several limb failures in the eucalypts, pines and peppers. This is probably not much of an issue, since it would be difficult to find a large enough space for them to remain in their present locations, in the planned apartment complex.

## Botanic / Common Name Cross Reference

| Botanic name | Common name |
|---|---|
| Ailanthus altissima | Tree of heaven |
| Alnus rhombifolia | White alder |
| Carya illinoinensis | Pecan |
| Eucalyptus camaldulensis | Red gum |
| Eucalyptus polyanthemos | Red box |
| Eucalyptus rudis | Flooded gum |
| Eucalyptus sideroxylon | Red ironbark |
| Fraxinus angustifolia 'Raywood' | Raywood ash |
| Fraxinus uhdei | Shamel ash |
| Geijera parvifolia | Australian willow |
| Pinus eldarica | Afghan pine |
| Pinus halepensis | Aleppo pine |
| Pinus halepensis | Aleppo pine |
| Pinus pinea | Italian stone pine |
| Populus fremontii | Fremont cottonwood |
| Pyrus calleryana | Callery pear |
| Quercus ilex | Holly oak |
| Salix lasiolepis | Arroyo willow |
| Sambucus mexicana | Mexican elderberry |
| Schinus molle | California pepper |
| Washingtonia robusta | Mexican fan palm |

## Common abbreviations in the following matrix include:

1s=one-sided
1sDb = one-sided dieback
2long = too long
B = Base
Brk = broken limb
Cod=codominant
Cr=crowding or crowded
CrS = crowded scaffolds
Crk = cracked limb
Db=dieback
*DBH – Diameter at breast height, i.e. 4.5'*
DL=dogleg,
DLS = dogleg scaffold limbs
DLT = dogleg trunk
EH=end heavy
epi = epicormic shoots
Hd = headed
Inc=included bark
Inj = injury, T-inj = trunk injury
LB = low branched
N W E S = north, west, east or south
OL = over-lifted
R = roots
S = scaffold limb(s)
Sh = shallow roots
Sp=sparse
Sup = suppressed
T = trunk
TB = tortoise beetle damage
T-bow = bowed trunk
Tinj = trunk injury
TO – tear out
Topd = Topped
Xing = crossing branches

"m" preceding an abbreviation indicates a minor problem. Underlined ones are more severe.

# Matrix of Findings

Tree numbers in **bold** are to be protected in place.

| Tree# | Species | DSH | Ht. | Can Dia | Health | Structure | Location | Comments |
|---|---|---|---|---|---|---|---|---|
| **1** | Eucalyptus camaldulensis | 17" B | 27 | 30 | B | D | E corner | TB 1s cod topd |
| **2** | Eucalyptus camaldulensis | 12+5 | 40 | 20 | B | D | E corner | TB DL topd clump |
| **3** | Eucalyptus camaldulensis | 9 | 40 | 20 | B | C- | E corner | TB DLT |
| **4** | Eucalyptus camaldulensis | 21 | 70 | 25 | C | B | East corner | TB Sp cod |
| **5** | Eucalyptus camaldulensis | 20+16 | 70 | 40 | C/B | B | East corner | TB cod |
| **6** | Eucalyptus camaldulensis | 23 | 75 | 40 | C | C | East corner | TB 1s cod topd |
| **7** | Salix lasiolepis | 16 | 25 | 50 | D | D | East corner | Topd toppled |
| **8** | Salix lasiolepis | 11 | 20 | 40 | D | D | East top | Topd leans brks |
| **9** | Salix lasiolepis | 10 | 20 | 30 | C | D | East top | Topd leans cod |
| **10** | Salix lasiolepis | 12"b | 20 | 40 | D | D | East top | Topd toppled 45º |
| **11** | Salix lasiolepis | 10 | 20 | 30 | D | D | East top | Topd toppled |
| **12** | Salix lasiolepis | 14 | 20 | 30 | C | D | East top | Topd 1s epi |
| **13** | Alnus rhombifolia | 16 | 30 | 30 | C | D | East | Topd |
| **14** | Salix lasiolepis | 13 | 30 | 30 | C | D | East | 1sDb cod |
| **15** | Salix lasiolepis | 13 | 20 | 40 | C- | D | East | Topd toppled on bank, cod inc |
| **16** | Salix lasiolepis | 13+10 | 45 | 50 | C | D | East | Leans 1s |
| **17** | Salix lasiolepis | 19 | 60 | 40 | B | C | East | Leans 1s |
| **18** | Eucalyptus camaldulensis | 17 | 80 | 35 | B | B | East | T-bow |
| **19** | Eucalyptus camaldulensis | 8 | 75 | 16 | C | B | East | OL Sp |
| **20** | Eucalyptus camaldulensis | 11 | 25 | 20 | B | D | East | Fell 70º thru #18 & 19 |
| **21** | Eucalyptus camaldulensis | 10 | 45 | 45 | B | D | East | Cr#22 45ºT |

| Tree# | Species | DSH | Ht. | Can Dia | Health | Structure | Location | Comments |
|---|---|---|---|---|---|---|---|---|
| **22** | Eucalyptus camaldulensis | 9 | 70 | 30 | B | B | East | Cr |
| **23** | Eucalyptus camaldulensis | 19+8 | 90 | 40 | B | C | East | 1s Cr |
| **24** | Eucalyptus camaldulensis | 10 | 80 | 20 | C | C | East | 1s Cr |
| **25** | Salix lasiolepis | 10 | 20 | 20 | C- | C | East | Sup cod Db |
| **26** | Salix lasiolepis | 10 | 20 | 20 | C- | D- | East | Toppled onto bank |
| **27** | Eucalyptus camaldulensis | 13 | 35 | 35 | C | D | East | Leans, base 1s T-bow |
| **28** | Eucalyptus camaldulensis | 48 | 100+ | 75 | B | C | East | Cod, dominate |
| **29** | Eucalyptus camaldulensis | 21 | 35 | 35 | C | D | East | Sup by #28, 1s Cr 45º |
| **30** | Eucalyptus camaldulensis | 10 | 40 | 12 | C | C | East | Stmp spts, Sup Cr |
| **31** | Eucalyptus camaldulensis | 11 | 55 | 18 | C- | C | East | DLT Sp Cr |
| **32** | Eucalyptus camaldulensis | 14+8 | 65 | 45 | B | C | East | 1s Cr |
| **33** | Eucalyptus camaldulensis | 11 | 35 | 20 | C- | D | East | 1s Sp Db |
| **34** | Eucalyptus camaldulensis | 14 | 80 | 30 | C | C | East | Cr#35 |
| **35** | Eucalyptus camaldulensis | 9 | 60 | 20 | C | C | East | Sup T-bow |
| **36** | Eucalyptus camaldulensis | 46 | 100+ | 90 | B | B | East | Cod, dominate |
| **37** | Eucalyptus camaldulensis | 38 | 100 | 70 | B | C | Southeast | Cr 1s |
| **38** | Eucalyptus camaldulensis | 12 | 70 | 30 | B | C | Southeast | T-bow 1s Cr |
| **39** | Eucalyptus camaldulensis | 10 | 40 | 20 | C | C- | Southeast | Sup by #37, 1s Cr Xing by #37 |
| **40** | Eucalyptus camaldulensis | 18 | 30 | 60 | C | D | Southeast | Toppled onto bank, harp form |
| **41** | Salix lasiolepis | 21 | 80 | 40 | B | C | Southeast | 1s Sup#37 toppled |
| **42** | Salix lasiolepis | 11 | 45 | 25 | B | D | Southeast | 1s Sup#37 topd Cr |
| **43** | Salix lasiolepis | 10 | 14 | 30 | C | D | Southeast | 45º T-bow to horizontal |
| **44** | Salix lasiolepis | 12 | 30 | 40 | C | D | Southeast | 45º |

| Tree# | Species | DSH | Ht. | Can Dia | Health | Structure | Location | Comments |
|---|---|---|---|---|---|---|---|---|
| **45** | Salix lasiolepis | 10 | 25 | 20 | C | C- | Southeast | 60º Cr |
| **46** | Salix lasiolepis | 10 | 40 | 15 | D | C | Southeast | 1s Cr |
| **47** | Salix lasiolepis | 16 | 70 | 35 | B | C- | Southeast | 1s Cr |
| **48** | Salix lasiolepis | 15 | 50 | 30 | B | C | Southeast | 1s Cr |
| **49** | Salix lasiolepis | 14 | 45 | 40 | B | C- | Southeast | 1s Cr |
| **50** | Eucalyptus camaldulensis | 21 | 100 | 50 | C | C | Southeast | 1s Sp Db |
| **51** | Eucalyptus camaldulensis | 11 | 35 | 25 | B | D | Southeast | Topd cod epi |
| **52** | Eucalyptus camaldulensis | 11 | 50 | 40 | C | D | Southeast | DLT 1s Sp |
| **53** | Salix lasiolepis | 16 | 45 | 50 | B | C- | Southeast | 1s Xing #52 T-bow |
| **54** | Eucalyptus camaldulensis | 9 | 50 | 16 | C | C | Southeast | Cr |
| **55** | Salix lasiolepis | 16 | 24 | 18 | D | D | Southeast | Top broke epi |
| **56** | Eucalyptus camaldulensis | 9 | 50 | 25 | B | C | Southeast | Cr cod |
| **57** | Salix lasiolepis | 16 | 50 | 20 | D | D | Southeast | Db |
| **58** | Salix lasiolepis | 16 | 50 | 20 | D | D | Southeast | Topd T-bow |
| **59** | Eucalyptus camaldulensis | 12 | 40 | 40 | B | D | Southeast | 1s TO T-bow Cr |
| **60** | Eucalyptus camaldulensis | 38 | 100+ | 70 | B | C | Southeast | Dominate 1s brk |
| **61** | Eucalyptus camaldulensis | 8 | 40 | 16 | B | B | Southeast | #62 presses on base |
| **62** | Salix lasiolepis | 15 | 28 | 45 | B | D | Southeast | 1s T-bow, fallen Euc on top |
| **63** | Populus fremontii | 33 @ 2' | 50 | 45 | B | C | Southwest | Cod 1s brk, roots exposed |
| **64** | Eucalyptus camaldulensis | 20+24+24+42 | 100 | 100 | B | C | Southwest | Cod inc Xing brk |
| **65** | Eucalyptus camaldulensis | 11+11 | 60 | 30 | C | C- | Southwest | 60º Cr cod 1s |
| **66** | Eucalyptus camaldulensis | 10 | 60 | 20 | C | C- | Southwest | Cr |
| **67** | Eucalyptus camaldulensis | 5+16+17 | 70 | 60 | C- | C- | Southwest | Xing Cr Cod inc |

| Tree# | Species | DSH | Ht. | Can Dia | Health | Structure | Location | Comments |
|---|---|---|---|---|---|---|---|---|
| **68** | Eucalyptus camaldulensis | 15 | 32 | 60 | B | C- | Southwest | Horizontal T, harp form |
| **69** | Eucalyptus camaldulensis | 18 | 50 | 40 | C | C | Southwest | Cod |
| **70** | Eucalyptus camaldulensis | 16 | 50 | 50 | B | B | Southwest | Cod |
| **71** | Eucalyptus camaldulensis | 42 | 100 | 100 | B | C | Southwest | Cod brks Db |
| **72** | Eucalyptus camaldulensis | 14 | 35 | 20 | B | D | Southwest | Stump spts DL leaning B |
| **73** | Eucalyptus camaldulensis | 24+25 | 90 | 70 | C | C | Southwest | Sup cod inc |
| **74** | Eucalyptus camaldulensis | 18 | 90 | 70 | C | C | Southwest | T-bow |
| **75** | Eucalyptus camaldulensis | 20 | 35 | 80 | B | D | Southwest | Fallen T, harp form |
| **76** | Eucalyptus camaldulensis | 12 | 12 | 30 | C | D- | Southwest | Toppled on bank |
| **77** | Eucalyptus camaldulensis | 9 | 45 | 26 | B | B | Southwest | okay |
| **78** | Eucalyptus camaldulensis | 22 | 90 | 40 | B | C | Southwest | 1s 2long |
| **79** | Eucalyptus camaldulensis | 10 | 50 | 20 | C | C | Southwest | Cr #78 |
| **80** | Eucalyptus camaldulensis | 11 | 12 | 12 | C | D | Southwest | Xing topd Cr |
| **81** | Eucalyptus camaldulensis | 11 | 30 | 25 | C | D | Southwest | Xing topd Cr |
| **82** | Eucalyptus camaldulensis | 11 | 60 | 30 | C | C | Southwest | Xing topd Cr |
| **83** | Eucalyptus camaldulensis | 12 | 55 | 40 | B | C | Southwest | Cod FC Cr |
| **84** | Eucalyptus camaldulensis | 20 | 90 | 40 | B | B | Southwest | Cod |
| **85** | Eucalyptus camaldulensis | 9 | 45 | 45 | C | B | Southwest | Sup #86 |
| **86** | Eucalyptus camaldulensis | 20 | 90 | 40 | B | C | Southwest | Cod 1s 2long |
| **87** | Eucalyptus camaldulensis | 10 | 50 | 40 | B | C | Southwest | 1s, T-bow Cr#88 |
| **88** | Eucalyptus camaldulensis | 17 | 70 | 45 | C | C | Southwest | 1s cod Cr |
| **89** | Eucalyptus camaldulensis | 22 | 100 | 70 | B | C | Southwest | 1s cod |
| **90** | Eucalyptus camaldulensis | 11 | 55 | 20 | B | C | Southwest | 1s cod Cr leans |

| Tree# | Species | DSH | Ht. | Can Dia | Health | Structure | Location | Comments |
|---|---|---|---|---|---|---|---|---|
| **91** | Eucalyptus camaldulensis | 26 | 80 | 50 | B | C- | Southwest | 1s cod Cr leans 2long |
| **92** | Eucalyptus camaldulensis | 11 | 70 | 20 | C | B | Southwest | Cr |
| **93** | Eucalyptus camaldulensis | 9+10+10 | 60 | 30 | B | C | Southwest | Cod inc |
| **94** | Eucalyptus camaldulensis | 9 | 50 | 20 | C | C | South | Cod |
| **95** | Eucalyptus camaldulensis | 9+11 | 60 | 26 | C | C | South | Cod |
| **96** | Eucalyptus camaldulensis | 10 | 50 | 26 | C- | C | South | Sp cod |
| **97** | Eucalyptus camaldulensis | 18+8 | 50 | 30 | C | B | South | Sp cod |
| 98 | Eucalyptus camaldulensis | 18 | 40 | 80 | B | C | Southwest | Toppled, harp form |
| 99 | Eucalyptus camaldulensis | 14 | 50 | 22 | B | B | Southwest | 1s |
| 100 | Eucalyptus camaldulensis | 17+21 | 60 | 40 | B | C | Southwest | 17"T-bow TO |
| 101 | Eucalyptus camaldulensis | 19 | 75 | 35 | C | B | Southeast | LB Sp top |
| 102 | Eucalyptus camaldulensis | 10 | 45 | 25 | C | C- | Southeast | \|Cod Tinj |
| 103 | Eucalyptus camaldulensis | 15+18 | 50 | 30 | C- | C | Southeast | 1s-cut, cod 1s infection |
| 104 | Eucalyptus camaldulensis | 18 | 70 | 35 | C- | C | Southeast | Cod infection |
| 105 | Eucalyptus camaldulensis | 21 | 60 | 40 | B | D | Southeast | TO |
| 106 | Eucalyptus camaldulensis | 12+6 | 30 | 30 | B | D | Southeast | Stump spts topd |
| 107 | Eucalyptus camaldulensis | 10 | 20 | 16 | C | D | Southeast | Topd wires |
| 108 | Eucalyptus camaldulensis | 10 | 20 | 16 | C | D | Southeast | Stmp spts topd wires |
| 109 | Eucalyptus camaldulensis | 22 | 70 | 35 | B | B | SE @ St. | Roots lifting street, CrS |
| 110 | Eucalyptus camaldulensis | 24"b | 60 | 40 | B | C | SE @ St. | Cod |
| 111 | Eucalyptus camaldulensis | 19 | 70 | 30 | C | B | SE @ St. | CrS |
| 112 | Eucalyptus camaldulensis | 15+13 | 20 | 25 | C | D | SE @ St. | DLT cod topd wires |
| 113 | Eucalyptus camaldulensis | 24 | 80 | 35 | B | C | SE @ St. | LB DLS Hd cod |

| Tree# | Species | DSH | Ht. | Can Dia | Health | Structure | Location | Comments |
|---|---|---|---|---|---|---|---|---|
| 114 | Eucalyptus camaldulensis | 16+26+27 | 90 | 80 | C- | C | Northeast | top-Db, cod 2long |
| 115 | Eucalyptus camaldulensis | 14 | 50 | 18 | C- | C- | Northeast | Leans |
| 116 | Eucalyptus camaldulensis | 21 | 60 | 30 | D- | F | Northeast | Dead top |
| 117 | Eucalyptus camaldulensis | 21 | 90 | 45 | C | C | Northeast | Sp cod 2long |
| 118 | Eucalyptus camaldulensis | 16+16"b | 40 | 35 | C- | D- | Northeast | Stump spts |
| 119 | Eucalyptus camaldulensis | 19 | 30 | 25 | C | D | Northeast | Stump spts, cut @ 6' |
| 120 | Eucalyptus camaldulensis | 8+4+4+4 | 30 | 25 | C | D | Northeast | Stump spts, cod inc Sp |
| 121 | Eucalyptus camaldulensis | 33+11 | 100 | 65 | C | D | Northeast | Sp cod epi |
| 122 | Eucalyptus camaldulensis | 13+13+10 | 50 | 40 | D- | C- | Northeast | 13"TDK Db |
| 123 | Eucalyptus camaldulensis | 23+13 | 60 | 50 | C- | C | Northeast | Cod inc 1s Sp |
| 124 | Eucalyptus camaldulensis | 23 | 95 | 50 | C | C | Northeast | Cod |
| 125 | Eucalyptus camaldulensis | 19 | 85 | 50 | C | C | Northeast | 1s |
| 126 | Eucalyptus camaldulensis | 20 | 80 | 40 | D- | C- | Northeast | Dead top with nest |
| 127 | Eucalyptus camaldulensis | 8+4 | 50 | 25 | D- | D | Northeast | Stmp spts, dead top Sp |
| 128 | Eucalyptus camaldulensis | 15 | 40 | 18 | D- | D | Northeast | 1s Sp dead top |
| 129 | Eucalyptus camaldulensis | 30"b | 60 | 35 | C | D | Northeast | Stmp spts, 2long 1s |
| 130 | Eucalyptus camaldulensis | 24 | 85 | 60 | C | C- | Northeast | Cod 2long |
| 131 | Eucalyptus camaldulensis | 5+5+6 | 40 | 20 | C | D | Northeast | Stmp spts Sp |
| 132 | Eucalyptus camaldulensis | 5+5+6 | 40 | 20 | C- | C | Northeast | Sup Db Sp |
| 133 | Eucalyptus camaldulensis | 18 | 80 | 40 | D | D | North | Sp Db |
| 134 | Eucalyptus camaldulensis | 22 | 70 | 30 | D | D | North | 1s cod Sp Sb Hd |
| 135 | Eucalyptus camaldulensis | 20" @ 2' | 80 | 30 | D | D | North | Cod 1s Sp Db |
| 136 | Eucalyptus camaldulensis | 8+10+11 | 60 | 30 | D | D | North | Dk seam, 10"T 1s Sp Sb |

| Tree# | Species | DSH | Ht. | Can Dia | Health | Structure | Location | Comments |
|---|---|---|---|---|---|---|---|---|
| 137 | Eucalyptus camaldulensis | 20+24 | 80 | 60 | D | D | North | Dk seam, 1s 2long |
| 138 | Eucalyptus camaldulensis | 22+16 | 100 | 60 | C | C- | West | 1s 2long infected |
| 139 | Eucalyptus camaldulensis | 15 | 80 | 20 | D- | D | West | Cod mDb |
| 140 | Eucalyptus camaldulensis | 17 | 50 | 20 | D | D | West | Cod 1s top-Db |
| 141 | Eucalyptus camaldulensis | 10+12 | 65 | 30 | C- | C | West | Cod 1s Sp |
| 142 | Eucalyptus camaldulensis | 24+20 | 95 | 70 | C- | C | West | Xing cod 2long mDb Sp |
| 143 | Eucalyptus camaldulensis | 12 | 60 | 30 | C | C | West | Cr Sup#144 1s |
| 144 | Eucalyptus camaldulensis | 42+20 | 100 | 100 | C- | C- | West | Cod Db 2long Sp, dominate |
| 145 | Eucalyptus camaldulensis | 9 | 35 | 20 | C | B | West | mT-bow |
| 146 | Eucalyptus camaldulensis | 26"b | 50 | 60 | D | D | West | Cod 1s Db |
| 147 | Eucalyptus camaldulensis | 16 | 75 | 15 | D- | D | West | Dead top |
| 148 | Eucalyptus camaldulensis | 21+11+12 | 90 | 45 | C- | C | West | Cod Sp mDb |
| 149 | Eucalyptus camaldulensis | 22 | 95 | 25 | C- | C | West | 1s Sp mDb |
| 150 | Eucalyptus camaldulensis | 25 | 100 | 45 | C- | C- | Southwest | Cod inc mDb |
| 151 | Eucalyptus camaldulensis | 34"b | 95 | 50 | C- | C- | Southwest | Cod inc mDb |
| 152 | Eucalyptus camaldulensis | 20+12+13 | 70 | 60 | C- | D | SW top | Cod Tinj 12"T toppled, harp form |
| 153 | Eucalyptus camaldulensis | 9 | 35 | 16 | C | B | Southwest | Sp |
| 154 | Eucalyptus camaldulensis | 14+4 | 35 | 25 | C | C | Southwest | Cod Sp |
| 155 | Eucalyptus camaldulensis | 34"b | 95 | 50 | D | D | Southwest | cod base, 1s Db Sp |
| 156 | Eucalyptus camaldulensis | 14+15 | 60 | 50 | C- | C | Southwest | Cod Sp mDb |
| 157 | Eucalyptus camaldulensis | 24 | 60 | 30 | D | D | Southwest | Cod inc top-Db Sp |
| 158 | Eucalyptus camaldulensis | 8+9 | 45 | 10 | D | D | Southwest | DkB cod inc dead-top |
| 159 | Eucalyptus camaldulensis | 4+4+4+5 | 50 | 35 | C | D | Southwest | Stmp spts |

| Tree# | Species | DSH | Ht. | Can Dia | Health | Structure | Location | Comments |
|---|---|---|---|---|---|---|---|---|
| 160 | Eucalyptus camaldulensis | 12 | 45 | 18 | C | D | SW edge | Cod OL 1s |
| 161 | Eucalyptus camaldulensis | 28 | 50 | 20 | C- | D | Southwest | Tinj stmp spts |
| 162 | Eucalyptus camaldulensis | 11+14+17 | 80 | 70 | C | C- | Southwest | Cod inc Xing CrT Sp |
| 163 | Eucalyptus camaldulensis | 17 | 60 | 30 | B | C | SW edge | Cod |
| 164 | Eucalyptus camaldulensis | 9+6 | 45 | 25 | C | C- | Southwest | Cod inc |
| 165 | Eucalyptus camaldulensis | 18 @4' | 50 | 18 | D | D | Southwest | Stmp spts top-db |
| 166 | Eucalyptus camaldulensis | 26"b | 75 | 45 | C | C | Southwest | Cod CrT mDb |
| 167 | Eucalyptus camaldulensis | 9 | 25 | 25 | C | C | SW corner | Cod mDb Sp |
| 168 | Eucalyptus camaldulensis | 4+17+5 | 60 | 18 | C | C- | Southwest | Cod Xing TO |
| 169 | Eucalyptus camaldulensis | 16"b | 50 | 16 | C | C | SW top | Cod inc |
| 170 | Eucalyptus camaldulensis | 14 | 50 | 24 | B | B | SW top | okay |
| 171 | Eucalyptus camaldulensis | 15+12 | 40 | 35 | C- | D | SW @ fence | Cod brk 1s Db |
| 172 | Eucalyptus camaldulensis | 16 | 60 | 20 | B | B | SW @ fence | okay |
| 173 | Eucalyptus camaldulensis | 26 | 78 | 70 | B | C | mid ravine | Cod LB DLS brks |
| 174 | Eucalyptus camaldulensis | 10 | 50 | 18 | C | B | mid top | OL Sp |
| 175 | Eucalyptus camaldulensis | 16"b | 18 | 15 | B | D | mid top | Topd wires, cod epi |
| 176 | Eucalyptus camaldulensis | 33 | 70 | 50 | D | D | mid top | Topd Db |
| 177 | Eucalyptus camaldulensis | 35 | 90 | 80 | C- | C | mid top | FC DL 2long |
| 178 | Eucalyptus camaldulensis | 38"b | 80 | 70 | D | D | N middle | Cod inc dead-top |
| 179 | Eucalyptus camaldulensis | 15+17 | 30 | 35 | C | D | Northwest | Topd wires |
| 180 | Eucalyptus camaldulensis | 29 | 30 | 30 | C | D | Northwest | Topd wires |
| 181 | Eucalyptus camaldulensis | 12+7 | 30 | 16 | C | D | Northwest | Topd wires |
| 182 | Eucalyptus camaldulensis | 6+12+9 | 30 | 30 | C | D | Northwest | Topd wires |

| Tree# | Species | DSH | Ht. | Can Dia | Health | Structure | Location | Comments |
|---|---|---|---|---|---|---|---|---|
| 183 | Eucalyptus camaldulensis | 5+8 | 30 | 22 | C | D | Northwest | Topd wires 1s |
| 184 | Eucalyptus camaldulensis | 22 | 100 | 30 | C | C- | Northwest | Brk @ top, Cr#185 |
| 185 | Eucalyptus camaldulensis | 10 | 30 | 25 | C | D | Northwest | T-bow 1s Sup#186 |
| 186 | Eucalyptus camaldulensis | 34"b | 80 | 50 | C | D | Northwest | TDb Dk-seams |
| 187 | Eucalyptus camaldulensis | 20+10 | 50 | 35 | C | D | Northwest | Dk seam, Sup#188 |
| 188 | Eucalyptus camaldulensis | 30 | 90 | 70 | C | C- | Northwest | Cod Hd 2long mDb |
| 189 | Eucalyptus camaldulensis | 15"b | 30 | 25 | C | D | Northwest | Stmp spts, |
| 190 | Eucalyptus camaldulensis | 37 | 100 | 80 | C | C | Northwest | 1s cod mDb |
| 191 | Eucalyptus camaldulensis | 14"b | 35 | 20 | C- | D | Northwest | Stmp spts Sp |
| 192 | Eucalyptus camaldulensis | 22 | 40 | 24 | D | D | Northwest | Dk-seam, top broke out, Sp |
| 193 | Eucalyptus camaldulensis | 14+16+18+9 | 90 | 70 | D | D | Northwest | Dk-seam, 2Ts deadat top, 2long |
| 194 | Eucalyptus camaldulensis | 24 | 70 | 50 | D | D | Northwest | 1s dead-top |
| 195 | Eucalyptus camaldulensis | 16 | 40 | 50 | D- | D | Northwest | T-bow dead-top |
| 196 | Sambucus mexicana | 12+7+12"b | 18 | 28 | C | D | Middle | LB cod Db |
| 197 | Pinus halepensis | 33 | 80 | 40 | B | C- | Middle | Cod inc |
| 198 | Populus fremontii | 10 | 22 | 24 | C- | D | Middle | Brk, dead top |
| 199 | Washingtonia robusta | 17 | 28 | 12 | B | A | Middle | Long skirt |
| 200 | Schinus molle | 19 @ 2' | 32 | 40 | A | C | Middle | Cod, LB |
| 201 | Eucalyptus rudis | 15 | 30 | 60 | B | D | NE corner | Toppled, harp form |
| 202 | Eucalyptus rudis | 12 @ 3' | 20 | 14 | B | D | NE corner | Stmp spts epi |
| 203 | Eucalyptus rudis | 12 | 50 | 20 | C | C | NE corner | LB 1s Cr#204 |
| 204 | Eucalyptus rudis | 12+8 | 50 | 18 | D | C | NE corner | LB 1s Cr#205, dead top |
| 205 | Eucalyptus rudis | 13 | 50 | 18 | C | C | NE corner | LB 1s Cr#204, Sp |

| Tree# | Species | DSH | Ht. | Can Dia | Health | Structure | Location | Comments |
|---|---|---|---|---|---|---|---|---|
| 206 | Eucalyptus camaldulensis | 16 | 45 | 24 | C | D | NE corner | Cod 1s Sp |
| 207 | Eucalyptus rudis | 11 | 50 | 20 | D | C | NE corner | 1s Sp |
| 208 | Eucalyptus rudis | 11 @ 1' | 55 | 24 | C | D | NE corner | LB cod inc |
| 209 | Eucalyptus rudis | 11 @ 1' | 45 | 12 | D | D | NE corner | Stmp spts Sp |
| 210 | Eucalyptus rudis | 7+4 | 5 | 14 | C | D | NE corner | Stmp spts Sp |
| 211 | Eucalyptus rudis | 15"b | 20 | 26 | D- | D- | NE corner | Stmp spts Sp Cr |
| 212 | Eucalyptus camaldulensis | 16"b | 45 | 28 | C | D | NE corner | Stmp spts 1s Cr#213 |
| 213 | Eucalyptus rudis | 10"b | 30 | 18 | D | D | NE corner | Stmp spts 1s Cr#214 |
| 214 | Eucalyptus rudis | 10 | 20 | 50 | C- | D | NE corner | Toppled 30° |
| 215 | Eucalyptus rudis | 12 | 40 | 30 | C- | D | NE corner | 1s leans, T-bow |
| 216 | Eucalyptus camaldulensis | 34"b | 90 | 60 | B | C- | NE corner | Cod inc 2long |
| 217 | Eucalyptus rudis | 13 | 80 | 20 | C- | C | NE corner | Sp Cr#216 |
| 218 | Eucalyptus rudis | 5+5 | 30 | 15 | D | C- | Mid north | Cod Sp |
| 219 | Pinus halepensis | 18 | 60 | 40 | C- | D | Mid north | 1sDb cod inc leans |
| 220 | Pinus halepensis | 10 | 65 | 20 | C- | C- | Mid north | mT-bow Sp |
| 221 | Pinus halepensis | 10 | 65 | 18 | D | D | Mid north | Sp |
| 222 | Pinus halepensis | 14 | 70 | 36 | C | C | Mid north | Cr#224 |
| 223 | Pinus halepensis | 16 | 60 | 40 | D | D | Mid north | Top-Db |
| 224 | Pinus halepensis | 19 | 90 | 40 | B | B | Mid north | Cr#222 |
| 225 | Pinus halepensis | 16 | 60 | 50 | D | D | Mid north | Dead top |
| 226 | Schinus molle | 5+4+4 | 20 | 30 | C- | D | Mid north | Cod inc Sp 1s Ts-bow |
| 227 | Schinus molle | 13+7+8 | 30 | 30 | D | D | Mid north | Sp cod inc Cr#228 |
| 228 | Schinus molle | 16+14 | 40 | 40 | C- | C | Mid north | Sp cod inc Cr#227 |

| Tree# | Species | DSH | Ht. | Can Dia | Health | Structure | Location | Comments |
|---|---|---|---|---|---|---|---|---|
| 229 | Schinus molle | 16 | 30 | 50 | C | C- | Mid north | Cod T-bow |
| 230 | Schinus molle | 26"b | 45 | 60 | C | C | Mid north | Cod |
| 231 | Pinus halepensis | 13 | 35 | 48 | C- | D- | N edge | 45º lean, 1s root uplift, chlor |
| 232 | Schinus molle | 18+8 | 30 | 30 | C- | C- | N edge | Sp cod Db |
| 233 | Eucalyptus camaldulensis | 22 | 80 | 40 | C | C | N edge | mDb TO Sp brk 2long |
| 234 | Quercus ilex | 8 | 20 | 18 | B | B | N corner | CrS LB |
| 235 | Pinus eldarica | 13 | 35 | 10 | D | C- | N corner | 1s Cr#236 |
| 236 | Pinus eldarica | 11 | 30 | 10 | D | C- | N corner | 1s Cr#237 |
| 237 | Pinus eldarica | 17 | 30 | 15 | D | C | N corner | 1s Cr#238 |
| 238 | Pinus eldarica | 10 | 30 | 10 | D | C- | N corner | 1s Cr#239 |
| 239 | Pinus eldarica | 13 | 35 | 16 | D | C | N corner | 1s Cr#240 |
| 240 | Pinus eldarica | 10 | 30 | 14 | D | D | N corner | 1s Cr#241, leans |
| 241 | Pinus eldarica | 7 | 30 | 12 | D | C- | N corner | 1s Cr#242 |
| 242 | Pinus eldarica | 9 | 30 | 16 | D | C- | N corner | 1s Cr#243 |
| 243 | Pinus eldarica | 16 | 40 | 20 | C- | C- | N corner | 1s Cr#244 2long |
| 244 | Pinus eldarica | 11 | 40 | 20 | C- | C- | N corner | 1s Cr#245 2long |
| 245 | Pinus eldarica | 11 | 45 | 18 | C- | C | N corner | 1s Cr#246 |
| 246 | Pinus eldarica | 8+9 | 40 | 18 | C | C- | N corner | 1s Cr#247 cod inc |
| 247 | Pinus eldarica | 7 | 30 | 15 | C- | C | N corner | 1s Cr#248 |
| 248 | Pinus eldarica | 8 | 30 | 12 | D- | D | N corner | 1s Cr#249 near dead |
| 249 | Pinus eldarica | 16 | 40 | 18 | D | C- | N corner | 1s Cr#250 Db |
| 250 | Pinus eldarica | 11 | 30 | 16 | D | D | N corner | 1s Cr#251 Db |
| 251 | Pinus eldarica | 7.5+6 | 40 | 18 | C- | D | N corner | 1s Cr#252 cod inc |

| Tree# | Species | DSH | Ht. | Can Dia | Health | Structure | Location | Comments |
|---|---|---|---|---|---|---|---|---|
| 252 | Pinus eldarica | 10 | 40 | 16 | C- | C | N corner | 1s Cr#253 mLean |
| 253 | Pinus eldarica | 12 | 40 | 18 | C | C | N corner | 1s Cr#254 |
| 254 | Pinus eldarica | 9 | 40 | 18 | C- | C- | N corner | 1s Cr#255 |
| 255 | Pinus eldarica | 9+6 | 35 | 20 | C- | D | N corner | 1s Cr#254, end of row |
| 256 | Pinus halepensis | 16 | 80 | 50 | C | D | N edge | 1s 60º lean |
| 257 | Pinus halepensis | 22 | 80 | 35 | B | B | N edge | okay |
| 258 | Geijera parvifolia | 10 @3' | 24 | 16 | C- | D | Mid north | Stubs, notch cut in T |
| 259 | Eucalyptus sideroxylon | 22 | 50 | 40 | B | C- | Mid north | Cod 2long Cr#260 |
| 260 | Eucalyptus polyanthemos | 22 | 50 | 30 | B | C | Mid north | Cod inc 1s Cr#259 |
| 261 | Schinus molle | 8+8+7 | 25 | 40 | E | D | Mid north | Cod inc Db brk |
| 262 | Schinus molle | 4+5+3 | 20 | 20 | C | C- | Mid north | Cod inc LB |
| 263 | Schinus molle | 5+6 | 12 | 16 | B | C- | Mid north | Cod inc LB |
| 264 | Pinus halepensis | 20"b | 60 | 30 | C | D | Mid north | Cod inc LB, twisted B |
| 265 | Pinus halepensis | 7 | 40 | 12 | D- | C- | Mid north | Near dead, T-bow |
| 266 | Pinus halepensis | 12 | 60 | 18 | D- | D | Mid north | 1s Sp |
| 267 | Pinus halepensis | 14 | 45 | 18 | C | C- | Mid north | 1s lean T-bow |
| 268 | Pinus halepensis | 8 | 50 | 12 | D | D | Mid north | Db Sp |
| 269 | Pinus halepensis | 9 | 60 | 16 | D | D | Mid north | Cr Db Sp |
| 270 | Pinus eldarica | 8 | 35 | 18 | D | D | Mid north | Dead top |
| 271 | Pinus eldarica | 9 | 40 | 16 | B | B | N edge | Full to ground |
| 272 | Schinus molle | 15+18 | 40 | 70 | A | C- | Mid north | Cod brk |
| 273 | Fraxinus angustifolia | 11 | 26 | 30 | C- | C- | Mid north | Top Db epi cod inc |
| 274 | Fraxinus angustifolia | 13 | 24 | 26 | C | C- | Mid north | Cod inc |

| Tree# | Species | DSH | Ht. | Can Dia | Health | Structure | Location | Comments |
|---|---|---|---|---|---|---|---|---|
| 275 | Schinus molle | 5+5+8 | 26 | 28 | B | C- | Mid north | Cod inc |
| 276 | Schinus molle | 12+10+9 | 26 | 36 | B | D | Mid north | Cod inc TO |
| 277 | Pyrus calleryana | 10"b | 22 | 18 | D | D | N edge | Cod inc Db Xing |
| 278 | Carya illinoinensis | 14 | 50 | 50 | C | C | N edge | Cod inc brk 2long |
| 279 | Carya illinoinensis | 9+10+12 | 50 | 60 | C | C | N edge | Cod 2long |
| 280 | Washingtonia robusta | | 30'th | 10 | C- | B | NW corner | Full skirt |
| 281 | Washingtonia robusta | | 45'th | 12 | C | B | NW corner | Long skirt |
| 282 | Washingtonia robusta | | 30'th | 14 | B | A | NW corner | Long skirt |
| 283 | Ailanthus altissima | 5+5 | 27 | 20 | B | D | NW corner | 1s cod T-seam |
| 284 | Eucalyptus rudis | 8+4+4 | 35 | 30 | B | D | NW corner | Cod inc Xing |
| 285 | Pinus pinea | 10 | 30 | 30 | A | B | NW corner | mLean |
| 286 | Washingtonia robusta | | 18'th | 10 | C | C | NW corner | Sup by#285, thin-T |
| 287 | Washingtonia robusta | | 26'th | 9 | C- | C | NW corner | Long skirt |
| 288 | Washingtonia robusta | | 18'th | 12 | B | B | NW corner | Full skirt w/plumbago in skirt |
| 289 | Morus alba | 6+7+7+6 | 30 | 32 | C | D | NW corner | DkB brk epi |
| 290 | Fraxinus uhdei | 24"b | 45 | 40 | B | C- | NW corner | Cod-TS, 1T-cut CrS |
| 291 | Eucalyptus rudis | 12 | 30 | 15 | B | D | NW corner | Cod inc Xing |
| 292 | Populus fremontii | 9 | 24 | 18 | C | D | NW corner | 1s cod brk DkT |
| 293 | Schinus molle | 5+6+7+8+7 | 27 | 40 | B | D | Middle | Cod inc CrTs |

DSH = diameter at standard height, i.e. 4.5 feet above grade. Spread is expressed as diameter of the canopy

# Photographic Documentation

The north part of the outflow area, looking northwest from the corner.  Tree #1 is at the far right.

The south part of the outflow area, looking northwest from the corner.


Tree #1 is topped for wires


Tree #6 is just far enough away to avoid topping.

Note jumble of trees, leaning trees, fallen limbs and seedlings in the outflow area

There are five Arroyo willows in this one group, and parts of others

This red gum fell through another group of willow and broke one.

Note the debris in the watercourse.

The edge of the outflow area, with the parallel group of redgums behind.

Overhead wires necessitated the topping of many trees in the arroyo.

Many of the redgums have crowded trunks pressing against each other.

Looking north in about the middle of the outflow area.


A multi-trunk red gum behind the northmost home on Vista Murrieta.

Note dieback, sparse foliage and epicormic shoots near #137

Trees #138 and #139 are infected, perhaps with Phytophthora.

#173 in a ravine in the central part of the site.

#197 Aleppo pine in a ravine in the central part of the site.

Large shrubs like these were not included.

Aleppo pines in severe drought stress.  Note dieback and chlorotic foliage.

Row of redgums behind the first house at the north corner of the site.


Row of Aleppos behind the first house at the north corner of the site.


#259 & 260 Red ironbark and red box respectively

#290 Shamel ash at left,  #291 and #292 to the right.

Mexican fan palms are not drought tolerant.  These are declining as indicated by the small heads and limited number of fronds.

These junipers are too small to enclude.  They lined the driveway at the west end of Vista Murrieta.

Far west end of Vista Murrieta, viewed from above, note browning.

# Testing & Evaluation

## Visual Analysis of Tree Condition

All the subject trees were evaluated for condition of the trunk, its lean, scaffold limbs, secondary branching, foliage density, and root crown condition. The root crown was examined, as far as it was visible, without excavation. However, the large amount of debris under most trees obscured the root crown.

The health was evaluated on a visual basis. If there were no nutrient deficiency symptoms, the foliage was full and dense, there were few dead twigs or limbs, and there were no pest or disease symptoms, it was assumed that they were healthy. To the degree that symptoms or problems existed, the trees were rated for health on a five point scale (A to F).

The condition of the structure, i.e. trunk, scaffold limbs and branches were evaluated on a similar five point scale. Likewise, the best structural condition is termed “A“ or excellent. If there were only a couple minor problems or defects, the condition is called “B“or good. If the structure was such that the tree was not in jeopardy, but it was not good, the condition is called “C “or fair. If the tree was at risk of some sort of failure, but might be corrected, the structural condition is called “D“ or poor. “F” is dead or dangerous.

The trunk diameter was measured with a Biltmore stick or calipers if the trunk was less than 8” diameter. The measurements were taken at 4.5 feet (DBH) to be in conformity with industry standards. If a tree branched low and the narrowest point of the trunk was below 4.5 feet, the diameter was measured there, i.e., at the narrowest point. Palm trunk heights were estimated.

# Discussion

## Construction Stress and Risk

The preservation of these trees should be based not only on the soundness, health and value of the trees, but how well they fit the new development plans. For instance, trees with large low limbs, like most of the California peppers, provide no space for people in their shade, and cutting off the lower limbs would require large cuts that would decay in a few years.

The preservation decision must also be based on an accurate forecast of the extra stresses imposed on trees during the construction period *and* landscaping, and the probable condition of the trees after both phases. The full effects of some construction damage, such as soil compaction or damage to large roots may not be apparent for years afterwards.

The main stresses and risks of construction are:

- Ignoring arborist reports and instructions
- Soil compaction
- Lack of water during construction
- Change of grade in the root zone
- Physical damage to the roots and upper structure
- Spilling or dumping of potentially toxic construction wastes
- Lack of pest control and other care
- Dust

All of these trees will be affected by the planned development to some degree, but least of all the trees in the outflow area. Most, if not all, need to be removed, except for the outflow area. Also, for those that remain, no matter what level of protection is given the trees from here on, there will be considerable stress imposed on any trees close to construction, at least by the dust. That would be all the trees not initially removed. It was also considered that in the new site use, future residents will walk or pass beneath the trees potentially weakened by work in the root zone. On the other, if a large tree or two could be retained in a locations where no pedestrian or vehicle traffic would ever occur beneath it, perhaps one or two could be used.

Trees in the outflow area provide some visual and environmental benefits, such as reducing erosion, helping clean water ending up in the water table, producing oxygen, and reducing particulate matter in the air. However, the large amount of fallen debris, including large limbs, trunks, whole trees, and trash related to past homeless camps, may lead to uncontrolled erosion. With some maintenance of the trees, the fallen limbs and trunks could be used for containing and controlling the water flow. This would also be useful for returning more organic matter to the soil and food web, compared to hauling it to the dump.

Construction dust is one impact that can be reduced by standard measures, but not eliminated. None of the outflow trees needs to be removed for construction, but they will have some dust impact.

There are limits to how close roots can be cut without sacrificing health or stability. Although I am a tree advocate, I believe that the lives of people are more important than trees, and I will recommend the removal of any tree that cannot be made reasonably safe. Some of the trees can be made reasonably safe with corrective pruning, but a formal risk assessment was not performed or requested. Typical construction can raise the risk level of the trees, if tree protection measures are not followed. This is why it is important to have a qualified tree risk assessor inspect the trees after construction and landscaping.

To determine which trees are a safe distance from construction, they need to be professionally surveyed. Arborists with iPads are not professional surveyors, and their tree locations are often off by 12-feet or more. Using GPS, I have seen professional surveyors off that much, even with their very expensive equipment.

Decay that may have been held in check when a tree was healthy can advance when the trees' reserve carbohydrates are reduced or depleted by construction impacts, or just by aging. Large roots cut for irrigation lines, underground utilities and footings can immediately render trees less stable during storms and strong winds. Large roots cut inside the root plate are also more likely to decay back into the base of the trunk. However, I cannot forecast which individual trees will be affected at this time, and without personally monitoring the work, of course. The planned grading work, will most likely require the removal

of all but the trees in the outflow area. If so, trees planted as part of the new landscape and mitigation, will over time produce more appropriate trees for the new site use, and benefit from early training.

## Pruning

Any further topping or heading is harmful and must be prevented. The State of California decries topping. Note California State Government Code 53067. Epicormic sprouts form from dormant buds and ray traces and have a weak attachment just in the outer growth ring(s). Normal branches are laminated on year after year with alternating branch and trunk tissue and have a very strong attachment. The shoots can be kept small to minimize the risk of their breaking out, but this will reduce the amount of green foliage and therefore the amount of food (carbohydrates from photosynthesis) that the trees get. This sort of "starvation" will reduce the tree's ability to form good new conductive vessels, healthy roots and strong compartmentalization.

Careful pruning *can* reduce the risk of limb failure in these trees, but careless or unprofessional pruning, such as has occurred, will make matters worse. A balance needs to be struck, based on the health of the tree and how many shoots need to be removed and how soon they need to be removed. To achieve such a balance will usually require good supervision by a certified arborist, but more appropriately by a board-certified master arborist or registered consulting arborist.

## Transplanting

Timing is very important to successful transplanting. The most abundant tree species around this site are the red gums. The few Mexican fan palms are all in poor condition, but never worth the trouble and expense of preservation. New ones will cost less and won't have to survive construction impacts.

The eucalypts cannot be transplanted successfully. Considering the nature of this apartment complex, and the grading and other site work, preserving trees in place is unlikely to be successful or possible. Construction has many impacts on trees, such as interruption of irrigation, physical impacts, and dust, but construction schedules are also seldom as planned. This also makes transplanting of other species unlikely to be successful.

If transplanting is the only reasonable way of preserving any of these trees, about the only ones with suitable structure are rated A or B in both health and structure. Transplanting is expensive and not always successful. There is little reason to transplant

weak, malformed or unhealthy trees. Having worked almost 20 years for two nurseries that grew trees in the ground and then boxed and sold them, I saw a fair percentage of culls and failures, and that was with nursery quality trees, trained, irrigated and professionally cared for. The Matrix of Findings and photographs below shows that very few of these trees could justify the time, expense and risk of transplanting.

## Soil Compaction

One of the major impacts of construction is soil compaction, both deliberate and circumstantial. Soil compaction is already at a near critical level due to decades of foot traffic, ATV and other vehicle traffic. The additional compaction of the soil at a developed site is beneficial for the construction of footings, structures, and paving, but almost fatal to the roots of trees. This soil compaction can often go well beyond the needs for footings. Root systems are very demanding and simply will not grow in compacted soil. A number of the necessary symbiotic partners of roots will not survive in less than ten percent pore space. Once soil is compacted, the usual methods of compaction reduction cannot be used without damaging the roots in the soil. Prevention and protection is the only realistic way to reduce soil compaction.

Covering the exposed soil areas around trees with mulch beds will eliminate the need to mow, reduce weeds, slowly increase root depth, and reduce root injuries. It also increases the amount of beneficial soil organisms and eventually reduces compaction. Using good green-waste mulch would improve the health of the soil and roots. The site's own green waste from tree removal and pruning could be chipped and spread to save money, improve the soil, and minimize land fill problems.

## Lack of Water

There is no irrigation taking place currently. So, water won't be disconnected or shut down during construction. But dry soil has benefits and drawbacks. The trees need water to survive. The more drought tolerant trees, like the eucalypts, could probably tolerate lack of supplemental irrigation for another year or more. However, trees like the cottonwoods and the palms are not very drought tolerant and not likely to survive another year. Even the pines are dying already from lack of water. The red gums are clearly stressed. The California peppers are about the only trees that don't appear drought stressed.

Any trees to remain should be deep watered before construction begins and kept well-irrigated inside the fenced protection zones during construction. Other non-protected landscape areas that will have foot or equipment traffic should be kept dry as dry as possible when the equipment traffic level is high and watered when it is low. Wet soil run over by equipment *will be* excessively compacted.

## Change of Grade in the Root Zone

Proposed grading plans are unknown to this consultant; however, without controls, the grade level near some trees may be changed. The soil level within the protection zone *must* remain unchanged. Changing the grade around trees is a health risk.

Having the proper proportion of air and water in the soil is related to proper watering and avoiding soil compaction. When roots are deprived of adequate oxygen they quickly die. For the fine feeder roots of a tree this can happen in a matter of minutes. When soil is piled on top of the root system, available oxygen is excluded and the soil compacted. The soil is permanently compressed below, so the effect can last years after a pile of soil is removed.

Piles of soil or spoils from trenches and footings can severely compact the soil below, and the equipment used to remove the piles can further compact the soil. To restore the original grade around existing trees, only track mounted small equipment is may be used to remove soil piles. This work must also be done when the soil in the haul route is dry.

## Physical Damage to the Roots and Structure

Damage to the upper structure of trees seems to always happen on job sites unless secure fencing is in place out to the dripline. Not everyone on a construction site knows about, or is concerned about trees. Only physical barriers work, and they need to be supplemented by the cooperation and help of the construction superintendent or inspectors.

Without real fencing, versus orange plastic snow fence, physical injuries to the trunk and branches are likely. Without controls, excavation, grading, or trenching for utilities or sprinkler lines is likely to damage roots. Beyond reducing the trees' health, such impacts could also destabilize the trees. Utilities need to be planned to avoid the root zones of trees. Tunneling may be needed to avoid ruining a valuable specimen. Although many people believe mature trees depend on strong, deep tap roots, it is a myth.

Many times trees that people have gone to great measures to preserve through development are severely injured when landscaping is installed under them. Digging holes for shrubs and ground covers can injure main lateral roots, causing extensive damage. Nicking the roots can also open up roots to infection. Trenching for irrigation mains and laterals needs to be carefully planned and implemented. Roto-tilling can also destroy a large percentage of the feeder roots.

## Spilling of Potentially Toxic Construction Wastes

Oil and hydraulic fluid from construction equipment, fuel, cement, concrete debris, asphalt, form oil, acid washes, paint and solvents are toxic to tree roots. Again, without fencing and active controls, such dumping is likely and often happens. Often debris is just buried on job sites. Concrete debris, some base materials and sand can also be harmful to soils. Concrete debris increases the alkalinity of the soil as do base materials that contain concrete or lime. Sand and gravel disrupt the capillary spread of water in the soil and can create a "perched water table" if enough material is buried. Detergents used to clean Port-a Johns can pollute the soil.

## Lack of Pest Control and Other Care

Construction can last for more than a year on projects such as this. During this time the pest cycles come and go, especially in spring. Most often pest control is put on hold or blocked by fencing until construction is finished. However, this is a stressful and demanding time for the trees. Pests can further deplete the reserves of trees and allow decay to advance. Drought stressed trees are more vulnerable to borers and certain other pests.

The redgum lerp psyllid killed tens of thousands of redgums and other eucalypts. It is presently being controlled naturally by a specific wasp brought in and released by the state, but even in Australia there are occasional flareups.

The invasive shot-hole borer (ISHB) is spreading quickly and has already killed tens of thousands of trees, including many native trees, e.g. the native willows near the Mexican border. It spreads a Fusarium disease that causes decay, and there is no effective treatment approved so far. The Huntington Botanic Garden said that almost a third of their 900 species are vulnerable. UCI may lose many of their sycamores. Preventative treatment is only partly effective, so the best that can be done is to recommend that only trees known to be resistant be planted.

Mexican fan palms and queen palms can be infected by the new Fusarium wilt, or the small Canary Island date palms can be infected by the old Fusarium wilt. Due to their poor health and condition, they should just be removed.

## Dust

Construction can create copious amounts of dust. Dust accumulates on leaf surfaces and in leaf pores. Dust can block the pores the leaves breathe through (stomata) and dust blocks sunlight, reducing photosynthesis. Dust can lead to mite infestation. The trees will need to be kept clean. Strict dust control measures will help, but dust is inevitable.

# Assumptions and Limiting Conditions

1. The City of Murrieta Historically Significant trees have special protection under Ordinance 16.42.050. This consultant has not been able to locate the City's list of "Historically Significant Trees". Removals, pruning and tree selection may require approval of the City Arborist.
2. Any legal description provided to this consultant is assumed to be correct. Any titles and ownerships to any property are assumed to be good and marketable. No responsibility is assumed for matters legal in nature. Any and all property is evaluated as though free and clear, under responsible ownership and competent management.
3. It is assumed that any property is not in violation of any applicable codes, ordinances, statutes, or other governmental regulations.
4. Care has been taken to obtain as much information as possible from reliable sources. Data has been verified insofar as possible. However, the consultant can neither guarantee nor be responsible for the accuracy of information provided by others.
5. This consultant shall not be required to give testimony or attend court by reason of this report unless subsequent contractual arrangements are made, including payment of an additional fee for such services as described in the fee schedule or contract of engagement.
6. Unless required by law otherwise, possession of this report or a copy thereof does not imply right of publication or use for any purpose by any other than the person and project to whom it is addressed, without the prior expressed written or verbal consent of this consultant.
7. Unless required by law otherwise, neither all nor any part of this report or a copy thereof, shall be conveyed by anyone, including the client, to the public through advertising, public relations, new, sales or other media without the prior expressed written consent of this consultant - particularly as to value conclusions, identity of the consultant, or any reference to any professional society or institute or to any initialed designation conferred upon this consultant as stated in his qualifications.
8. This report and any values expressed herein represent the opinion of this consultant, and this consultant's fee is in no way contingent upon the reporting of a stipulated result, the occurrence of a subsequent event, nor upon any finding to be reported.

9. Photographs in this report, being intended as visual aids, are not necessarily to scale and should not be construed as engineering or architectural reports or surveys unless expressed otherwise. The reproduction of any information generated by architects, engineers, or other consultants on any sketches, drawings, or photographs is for the express purposes of coordination and ease of reference only. Inclusion of said information on any drawings or other documents does not constitute a representation by Arborgate Consulting as to the sufficiency or accuracy of said information.
10. Unless expressed otherwise: 1) information contained in this report covers only those items that were examined and reflects the condition of those items at the time of inspection; conditions change and monitoring is needed to stay abreast of these changes, and 2) the inspection is limited to visual examination of accessible items without dissection, excavation, probing, or coring. There is no warranty or guarantee, expressed or implied, that problems or deficiencies of the plants or property in question may not arise in the future.
11. This report is the completed work product. Any additional work, including, e.g. production of a site map, tree survey, planting plan, addenda and revisions, monitoring, or inspection of tree protection measures, must be contracted separately by others.
12. Use of the report is dependent upon payment and non payment voids all legal use of the report. Ownership of any documents produced passes to the Client only when all fees have been paid.
13. Loss or alteration of any part of this report invalidates the entire report.

# Contingent and Limited Conditions

Transplanting is not considered in the recommendations of this report. These trees are evaluated as they currently are. Transplanting cuts roots and puts them into shock, from which it can take a year or more per inch of DSH to fully recover.

If any trees are preserved outside the outflow, there will probably be a need to make sure the trees are safe for their proposed new surroundings. Since almost all the trees are planned for removal, this report does not address such specific pruning needs. Without that operation, the trees may have high risk and little value. A hazardous tree that remains hazardous has no value, except a negative value, the cost of removal.

Production of a tree location map or a planting plan is not in the scope of this consultant. The accuracy demanded by the City is beyond the capability of this consultant, and production of a planting plan is more within the scope of a landscape architect.

# Recommendations

## Removals

The City of Murrieta asks that landscape plans identify trees over 9.5" in diameter and be identified on the plan individually as to caliper size, type, and labeled to be retained or removed (see Murrieta Municipal Code - Title 16.42 Tree Preservation). In this case, a blanket statement should suffice stating that all the trees, except the designated outflow area near the corner of Sparkman and Murrieta Hot Springs Road, be considered as being removed. Justification follows:

First, it needs to be understood that this consultant sees little chance that any good trees can be retained through typical grading operations on such a project as this. There are few “good” trees on this site. If any of the larger trees are to be preserved and provided adequate space for future growth, it will probably mean that the plans need to be changed and fewer units built.

Secondly, the vast majority of trees on this site are found on the list, Murrieta “Wildland Urban Interface Undesirable Plants & Trees”, namely, the pines, palms, red gums, pines and California peppers. Only 40 (13%) of the nearly 300 trees on site are not on this list. Twenty-eight of the 40 trees not on that list are in poor condition and are found in the outflow area. Only 4 of the 40 are in C or better condition.

Many trees are in such poor health or structural condition that removal is necessary. Of the trees not on the aforementioned list, only 4 have a C or better condition rating. All trees rated "D" or "F" for health or structure should be removed. This leaves few trees worth saving. All the trees, except those in the outflow area, will be removed for grading and construction. Any trees at the edges of the outflow area that are more likely to fall or drop limbs should be removed before the public has access to the area near them, depending on their future context, but no immediate failures are expected, except in the upper part of the outflow area. While this report is not, and should not be considered a true risk assessment, per ANSI A300, part 9, note that the outflow area is not suitable for public access. If this area is fenced off, then the only risk would be to workers assigned to keep it suitable for outflow, and the risk will be low.

The trees that remain in the outflow area will need very basic maintenance. The entire area will be fenced off. Maintenance will be mostly to keep out homeless camps, dumping, remove undesirable weeds, remove trash and objects that reduce its effectiveness as an outflow area, and maintain flow and avoid ponding or circumstances that may comprise the root structure.

Consider that removing trees after the site is in use will be more expensive, dangerous, and disruptive. It is impossible to predict where all the roots are. Sometimes times trees affected by work inside the protection clearance radius do survive. However, considering the current stress level among these trees, risking that they might survive has low odds of success.

Prior to demolition, meet on site with the contractor and clearly mark all trees to be removed. Impress on the demolition contractor that if there are adjoining trees to remain, the roots of the tree to be removed must be cut by a trencher prior to being grubbed out. Cutting intertwined limbs or branches may also be necessary. Otherwise, the roots or limbs of the adjoining tree may be damaged or ripped up with the roots or limbs of the removed tree.

Desirable trees that the owner or City wants to save, should have more extensive study done to determine as precisely as possible the extent and depth of their root systems. In addition, an accurate survey, versus GPS, needs to be done to verify or know there will be sufficient room to preserve such trees before construction begins. Stake off and measure the limits of grading and construction near trees to remain and compare to the following matrix. Deep water trees to be remain prior to construction.

## Urban Wood Value

The primary tree species, the red gum, in Australia is used like we use our native redwoods. The wood is very decay resistant and durable enough for outdoor use. West Coast Arborists Inc. 714-991-1900 has produced very attractive garden benches from red gums. This is not their main business, but they may have contacts that work in this type of business. Robert Little or Julia Bartens, with Cal Fire, 916-657-2289, may have information for southern California.

# Future Landscaping

To achieve a long-lasting sustainable landscape and lower maintenance costs, the landscape architects and site designers should attempt to provide as much root space as possible and still select smaller tree species. Root space around existing trees in enclosed areas should be expanded and include mulching to maximize root depth and volume.

Prior to construction, carefully remove the weeds, turf and ground cover below trees to remain, and replace it with a 3-4" deep layer of coarse-textured, green-waste type mulch, e.g. tree chips. While removing the weeds, turf and ground cover, be careful not to damage shallow roots.

The new landscape plan should be designed and installed to protect and improve the health and habitat of the preserved trees. The trees closer to construction may be in critical care for a decade or more. Once they are clearly recovered, more liberties can be taken with the surrounding landscape.

Irrigation in particular must be designed for the needs of the trees first. Spot bubblers will not serve the needs of mature trees. Deep watering devices sound helpful, but they require water to be drawn up through capillary action and the salts are deposited near the surface rather than being leached below the roots. Low precipitation systems will allow deep irrigation to leach salts and improve root health. Fewer, but larger heads will allow less trenching and less trenching causes less root damage. Trenches that approach trees directly toward the trunk will cut fewer roots than trenches passing their canopy as a tangent. Irrigation design around existing trees needs to be more specific and less schematic.

As much as possible, turf, ground cover, and other planting should be eliminated under these trees. Any shrubs should be planted outside the driplines of these trees or have the planting holes dug using an AirSpade. Mulch beds will be the best way to improve root health and depth. Do not use bark mulch, or mulch containing manure. Cover all the soil at least under the driplines and between surrounding paving areas, but do not apply against the trunks.

## Pruning

The only pruning that is likely to be needed is in the outflow area. First remove dead, fallen, and topped trees to provide a safer working space. The main focus of this work should be to clear the flow area, reduce risk and improve stability. All pruning should be done by properly licensed and insured tree service that provides a certified arborist to supervise his crew. The project consulting arborist should oversee the pruning of sample trees of each species. The tree service must demonstrate ability to carry out an understanding of the instructions before allowing them to proceed.

Do not allow the general contractor to cut on any trees for any reason. Even clearance pruning should be done only by the properly licensed and insured tree service, with the general contractor's information of clearance needs.

Focus on balance, reducing the length of overly long limbs, and control (not necessarily removal) of epicormic shoots. Do not remove more than 20% foliage, and then only when the tree is healthy and the season is correct. Less is better. Fall or winter is the best time to prune the willows.

Follow the ANSI A300, part 1 pruning standards and the ISA supporting publication "Best Management Practices, Pruning".

# General Tree Preservation Recommendations

It is anticipated that only trees in the outflow area will be preserved.

1. Protection Barrier: A protection barrier shall be installed around any trees to be preserved. In this case, the whole outflow area can be enclosed until clearing and pruning. The barrier shall be constructed of 6' high chain-link fencing. The barrier shall be placed as far from the base of the tree(s) as possible, preferably at or beyond the dripline and the health clearance radius. The health clearance radius is equal in feet to the trunk diameter (DSH), i.e. one inch DSH equals one foot clearance radius. The fencing shall be maintained in good repair throughout the duration of the project, and shall not be removed, relocated, or encroached upon without permission of the arborist involved.
2. Storage of Materials: There shall be NO storage of materials or supplies of any kind within the area of the protection zone. Concrete and cement materials, block, stone, sand and soil shall not be placed within the protection zone of the tree.
3. Fuel Storage: Fuel storage shall NOT be permitted within 150 feet of any tree to be preserved. Refueling, servicing and maintenance of equipment and machinery shall NOT be permitted within 150 feet of protected trees. Equipment that leaks hydraulic fluid shall be removed from the site immediately.

4. Debris and Waste Materials: Debris and waste from construction or other activities shall NOT be permitted within the protection zone. Wash down of concrete or cement handling equipment, in particular, shall NOT be permitted within 150 feet of protected trees.
5. Grade Changes: Grade changes can be particularly damaging to trees. Even as little as two inches of fill can cause the death of a tree. Lowering the grade can destroy major portions of a root system. Any grade changes proposed should be approved by a Registered Consulting Arborist before construction begins, and precautions taken to mitigate potential injuries.
6. Damages: Any damages or injuries should be reported to the project arborist as soon as possible. Severed roots shall be pruned cleanly to healthy tissue, using proper pruning tools. Broken branches or limbs shall be professionally pruned according to International Society of Arboriculture "Best Management Practices – Pruning", and ANSI A-300, part 1 Pruning Standards.
7. Preventive Measures: Pruning of the tree canopies and branches should be done at the direction of the project arborist to remove any dead or broken branches, and to provide the necessary clearances for the construction equipment.

# Appendix

**A. Resume**

**B. Glossary**

**C. Credentials**

## A. Resume GREGORY W. APPLEGATE, ASCA

PROFESSIONAL REGISTRATIONS:

American Society of Consulting Arborists - Registered Consulting Arborist #365
American Society of Consulting Arborists – Tree & Plant Appraisal Qualified
International Society of Arboriculture - Tree Risk Assessment Qualified
International Society of Arboriculture - Certified Arborist # WE-180a

EXPERIENCE:

Mr. Applegate is an independent consulting arborist. He has been in the horticulture field since 1963, providing professional arboricultural consulting since 1984 within both private and public sectors. His expertise includes appraisal, tree preservation, diagnosis of tree growth problems, construction impact mitigation, environmental assessment, expert witness testimony, hazard evaluation, pruning programs, species selection and tree health monitoring.

Mr. Applegate has consulted for insurance companies, major developers, theme parks, homeowners, homeowners' associations, landscape architects, landscape contractors, property managers, attorneys and governmental bodies.

Notable projects on which he has consulted are: Disneyland, Disneyland Hotel, DisneySeas-Tokyo, Disney's Wild Animal Kingdom, the New Tomorrowland, Disney's California Adventure, Disney Hong Kong project, Knott's Berry Farm, J. Paul Getty Museum, Tustin Ranch, Newport Coast, Crystal Court, Newport Fashion Island Palms, Bixby Ranch Country Club, Playa Vista, Laguna Canyon Road and Myford Road for The Irvine Company, MTA Expo Line, MWD-California Lakes, Paseo Westpark Palms, Loyola-Marymount campus, Cal Tech, Cal State Long Beach, Pierce College, The Irvine Concourse, UCI, USC, UCLA, LA City College, LA Trade Tech, Riverside City College, Crafton Hills College, MTA projects, and the State of California review of the Landscape Architecture License exam (re: plant materials)

EDUCATION:

Bachelor of Science in Landscape Architecture, California State Polytechnic University, Pomona 1973
Arboricultural Consulting Academy (by ASCA) Arbor-Day Farm, Kansas City 1995
Continuing Education Courses in Arboriculture, required to maintain Certified Arborist status and for ASCA membership

PROFESSIONAL AFFILIATIONS:

American Society of Consulting Arborists (ASCA), Registered member
International Palm Society, Full member
International Society of Arboriculture (ISA), Certified member
California Tree Failure Report Program, UC Davis, Participant
Street Tree Seminar (STS), Member

COMMUNITY AFFILIATIONS:

Horticulture Advisory Committee, Saddleback College (1988 -1999)
Landscape Architecture License Exam, Reviewer, Cal Poly Pomona (1986-90)
American Institute of Landscape Architects (L.A.) Board of Directors (1980-82)
California Landscape Architect Student Scholarship Fund - Chairman (1985)
International Society of Arboriculture - Examiner-tree worker certification (1990)
Guest lecturer at UCLA, Cal Poly, Saddleback College, & Palomar Junior College
ASCA 2011 Nominations Committee and A3G appraisal update committee
ASCA, Industry definitions committee 2009-2010
ASCA web site, west coast tree question responder (2007-2016)

# B. Glossary

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| **ANSI-A300** | American National Standards Institute performance standards for the care and maintenance of trees, shrubs and other woody plants. Consists of nine parts in separate documents. Part 1 covers pruning. |
| **Arboriculture** | The cultivation and care of trees and shrubs. |
| **Arborist** | professional who possesses the technical competence gained through experience and related training to provide for or supervise the management of trees and other woody plants in residential, commercial or public settings. |
| **Biltmore stick** | a graduated rule used by timber estimators in determining tree diameters |
| **Caliper** | Diameter of a tree trunk. Larger trees are usually measured at 4½ feet (see DBH) Trees with calipers 4 inches and below are measured at 6 inches above grade. Trees above 4 inches, but still transplantable are measured at 12 inches above grade. |
| **Codominant** | stems: two or more vigorous and upright branches of relatively equal size that originate from a common point, usually where the leader has been lost or removed. |
| **Compaction** | (Soil Compaction) The compression of soil, causing a reduction of pore space and an increase in the density of the soil. Tree roots cannot grow in compacted soil. |
| **Conifer-** | A gymnosperm which bears cones, such as pine or fir, but sometimes another of the Coniferae group which does not produce cones, such as Gingko. |
| **Crotch** | The union of two or more branches; the axillary zone between branches. |
| **Crown** | The upper portions of a tree or shrub, including the main limbs, branches, and twigs. |
| **Crown restoration** | method of restoring the natural growth habit of a tree that has been topped or damaged in any other way, aka restoration pruning. |
| **DSH** | Diameter of the trunk, measured at breast height or 54 inches above the average grade. Syn. = caliper. |
| **Decay** | Progressive deterioration of organic tissues, usually caused by fungal or bacterial organisms, resulting in loss of cell structure, strength, and function. In wood, the loss of structural strength. |
| **Decline** | Progressive reduction of health or vigor of a plant. |

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| **Decurrent** | Referring to crowns which are made up of a system of codominant scaffold branches. Lacking a central leader. |
| **Dieback** | Progressive death of buds, twigs and branch tissues, on individual limbs, or throughout the canopy. |
| **Dominant** | Trees that protrude above the average canopy height. |
| **Drop-crotch** | Reduction cuts meant to shorten a limb or branch by cutting back to an inner branch that can serve as the new end of the limb. |
| **Epicormic** | Epi - upon; cormic – stem. Branches that are upon the stem, i.e. sprouting from either dormant buds in the cambial zone, or from buds sprung anew from ray traces. Epicormic shoots are a sign that energy reserves have been lowered. |
| **Grading** | Also Regrading. Intentional altering of topography and soil levels, using machinery. |
| **Harp form** | After a tree falls, if it lives, it produces new upright stems resembling strings on a harp. |
| **Hazardous condition** | The combination of a likely failure of a tree or tree part with the presence of a likely target. |
| **Heading** | Pruning techniques where the cut is made to a bud, weak lateral branch or stub. |
| **Included bark** | Bark or cortex tissue that is included or trapped between close-growing branches. Usually found in narrow or tight crotches. |
| **Leader** | A dominant upright stem, usually the main trunk. There can be several leaders in one tree. |
| **Limb** | A large lateral branch growing from the main trunk. |
| **Maintenance** | weed control, fertilizing, irrigation, trash removal and other related tree care activities. |
| **Palm** | A tropical or subtropical monocotyledonous tree or shrub, usually having a woody, unbranched trunk and large, evergreen, fan or feather-shaped leaves at the top. |
| **Reduction cut** | A pruning cut meant to shorten a limb or branch by cutting it back to an inner branch that will serve as the new end of the limb or branch. |
| **Root crown** | The flared area at the base of a tree where the roots and trunk merge. Also referred to as the "root flare". |
| **Root plate** | The stiff primary roots close to the trunk and able to provide compressive support. |
| **Root system** | The portion of the tree containing the root organs, including buttress roots, transport roots, and fine absorbing roots; all underground parts of the tree. |

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| **Root zone** | The area and volume of soil around the tree in which roots are normally found. May extend to three or more times the branch spread of the tree, or several times the height of the tree. |
| **Scaffold** | large, main branches that form the main structure of the crown. |
| **Skirt** | In palms, the accumulated dead fronds still attached to the trunk below the live fronds. |
| **Species** | Taxonomic classification below genus. 1. A group of plants with common characteristics or consistent differences in morphology, ecology or reproductive behavior, distinct from others of the same genus. 2. The basic unit in plant taxonomy; the Latin binomial consisting of the genus and specific epithet; it is both singular and plural. |
| **Sprout** | Also water sprout. A shoot or stem that grows from the bark of a tree; adventitious or secondary growth. |
| **Stump sprouts** | dormant bud or adventitious shoot from a tree stump |
| **Stress** | "Stress is a potentially injurious, reversible condition, caused by energy drain, disruption, or blockage, or by life processes operating near the limits for which they were genetically programmed." Alex Shigo |
| **Suppressed** | (crown class) Trees which have been overtopped and whose crown development is restricted from above. |
| **Value** | Value is the present worth of future benefits. Value is not necessarily cost. |
| **Wound** | Any injury which induces a compartmentalization response. |

## D. Credentials

# The International Society of Arboriculture

Hereby Announces That

*Gregory W. Applegate*

Has Earned the Credential

## ISA Certified Arborist ®

By successfully meeting ISA Certified Arborist certification requirements through demonstrated attainment of relevant competencies as supported by the ISA Credentialing Council

Caitlyn Pollihan
CEO & Executive Director

| 28 July 1997 | 30 June 2024 | WE-0180A |
|---|---|---|
| Issue Date | Expiration Date | Certification Number |

ANAB
ANSI National Accreditation Board
ACCREDITED
ISO/IEC 17024
PERSONNEL CERTIFICATION BODY
#0847
ISA Certified Arborist

# *The American Society*
*of*
# *Consulting Arborists*

*in recognition of fulfillment of the requirements for*

*Registered Consulting Arborist® status*

*confers upon*

## Gregory W. Applegate, RCA #365

*Registered Membership*

Dr. James R. Clark, RCA #357
President

Beth W. Palys, FASAE,CAE
Executive Director

E.

# The International Society of Arboriculture

Hereby Announces That

*Gregory W. Applegate*

Has Earned the Credential

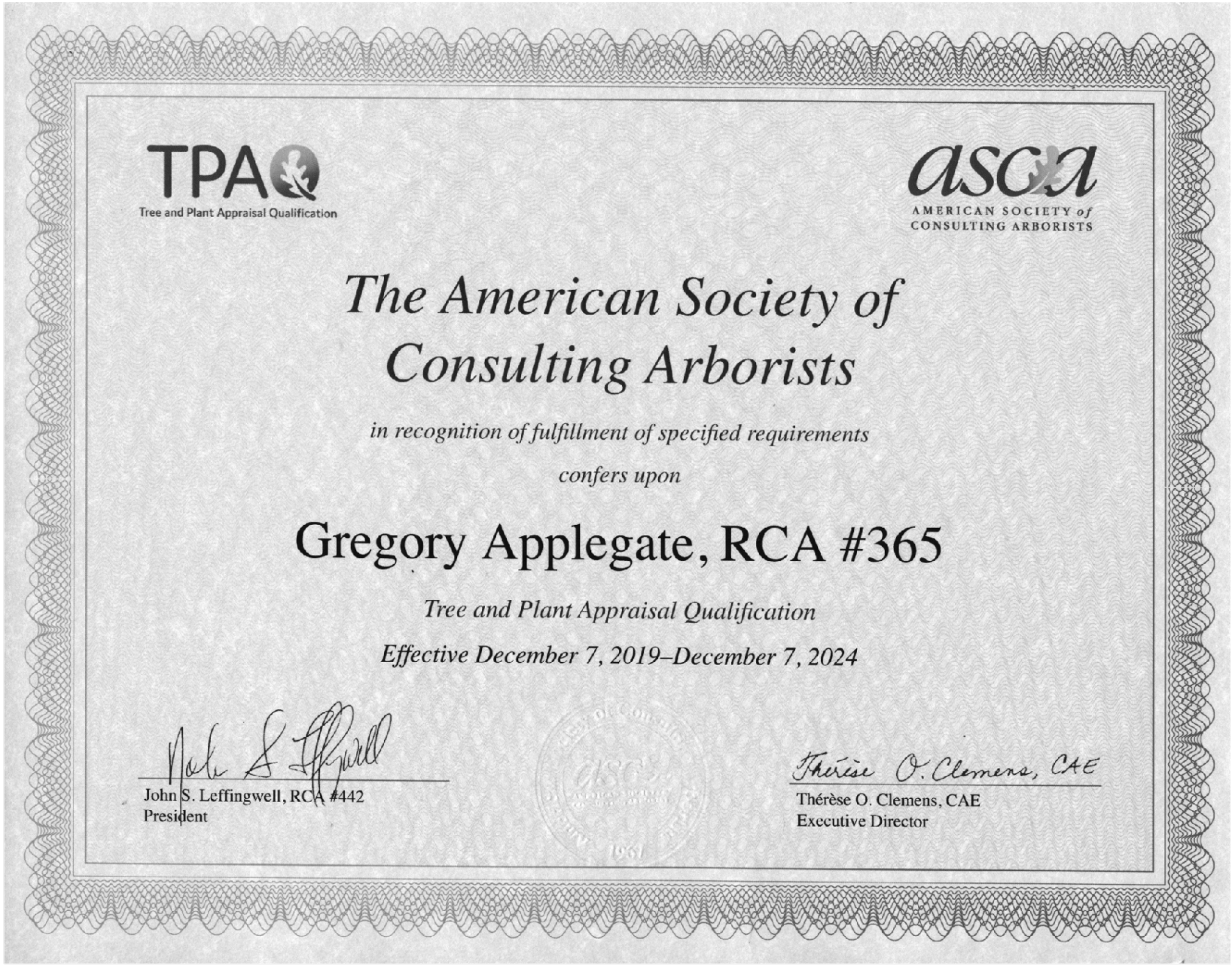
## ISA Tree Risk Assessment Qualification®

By successfully meeting ISA Tree Risk Assessment Qualification certification requirements through demonstrated attainment of relevant competencies as supported by the ISA Credentialing Council

Caitlyn Pollihan
CEO & Executive Director

| 11 February 2013 | 30 September 2022 |
|---|---|
| Issue Date | Expiration Date |

F.



TPA
Tree and Plant Appraisal Qualification

asca
AMERICAN SOCIETY of CONSULTING ARBORISTS

# The American Society of Consulting Arborists

*in recognition of fulfillment of specified requirements*

*confers upon*

## Gregory Applegate, RCA #365

*Tree and Plant Appraisal Qualification*

*Effective December 7, 2019–December 7, 2024*

John S. Leffingwell, RCA #442
President

Thérèse O. Clemens, CAE
Executive Director

# Disclaimer

Good current information on tree preservation has been applied. However, even when every limb and root is inspected, inspection involves sampling, therefore some areas of decay or weakness may be missed. Weather, winds and the magnitude and direction of storms are not predictable and some failures may still occur despite the best application of high professional standards. Future tree maintenance will also affect the trees health and stability and is not under the supervision or scrutiny of this consultant. Continuing construction activity such as trenching will also affect the health and safety, but are unknown and unsupervised by this consultant. Trees are living, dynamic organisms and their future status cannot be predicted with complete certainty by any expert. This consultant does not assume liability for any tree failures involved with this property.

# Certification

I, Gregory W. Applegate, certify to the best of my knowledge and belief:

That the statements of fact contained in this report are true and correct. That the report analysis, opinions, and conclusions are limited only by the reported assumptions and limiting conditions, and are my personal unbiased professional analysis, opinions and conclusions.

That I have no present or prospective interest in the vegetation that is the subject of this report, and I have no personal interest or bias with respect to the parties involved.

That my compensation is not contingent upon the reporting of a predetermined condition that favors the cause of the client, the attainment of stipulated result, or the occurrence of a subsequent event.

That my analysis, opinions, and conclusions were developed, and this report has been prepared, in conformity with the standards of arboricultural practice. As of this report date, I have completed the requirements of continuing education for Registered Consulting Arborist and Certified Arborist.

That I have made a personal inspection of the trees that are the subject of this report. No one provided significant professional assistance to the person signing this report.

Furthermore, the opinions above are held with reasonable degree of professional certainty, predicated on over 50 years of experience in the nursery, landscape, and arboricultural industries and the documents and information provided me.

I do not authorize out of context quoting from or partial reprinting of this report. Neither all or any part of this report shall be disseminated to the general public by the use of media for public communication without the prior written consent of the undersigned.

Arborgate Consulting, Inc.
Gregory W. Applegate  Date 08-10-22
Registered Consulting Arborist #365