

Fire Protection Plan

for
Otay Ranch Villages 2, 3
and a portion of 4
City of Chula Vista



submitted by

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1. INTRODUCTION AND SCOPE

This Fire Protection Plan for the Otay Ranch Villages 2, 3 and a portion of 4 is required by the Chula Vista Fire Department and responds fully to the requirements of Article 86 of the 2001 California Fire Code, which requires a Fire Protection Plan for all new development in the Urban Wildland Interface. This plan also fully complies with the City of Chula Vista Fire Code. This Fire Protection Plan reflects the recommendations of the consultant, Hunt Research Corporation, and is subject to review and approval by the Chula Vista Fire Marshal.

Per discussions with the Fire Marshal, the focus and scope of this plan is limited to the perimeter areas of the development exposed to Wolf Canyon, and to the remaining perimeter slopes around the development. The remainder of the development is considered by the Fire Marshal to be an urban, non-wildland, fire threat and therefore out of the scope of this plan. Enhanced structural protection is therefore limited to “hardening” structures on the perimeters facing Wolf Canyon. Structures and vegetation elsewhere in the development are not considered an Urban Wildland Interface threat by the Fire Marshal, other than the spotting hazard. Recommendations regarding private property landscaping and decks on private lots are included in the Appendix D of this plan.

2. PROJECT DESCRIPTION

This project consists of Village 2 (Village of Montecito), Village 3 (Otay Ranch Business Park) and a portion of Village 4 (Community Park) within the Otay Ranch. The site is comprised of 1,187 acres located south of Olympic Parkway, east of the Otay Landfill, north of the Otay River Valley and west of Village 7. Village 2 consists of 604 single family residential lots and 3941 multi-family units (including 2 story detached homes, 2 story row townhomes, duplexes and triplexes), 22.5 acres of mixed use development 24 acres of parks, open space, existing Chula Vista Fire Station #7, six community purpose facility sites, existing Otay Ranch High School and a two new elementary school sites. Access to this site is provided from Olympic Parkway, La Media Road and the future extension of Heritage Road, all six-lane arterials.

Single-family detached dwellings range from 3,249 sq feet to 5,687 square feet.

The estimated 24-hour population of Village 2 is 14,726 persons (based on an estimate of 3.24 persons per household x 4,545 units).

Village 3 is a 368.4 acre site with 176.5 acres of business park uses, a 10.2 acre community purpose facility site, and slope areas. Access to this site is provided from the future extension of Heritage Road and Main Street/Rock Mountain Road, all six-lane arterials.

Village 4 is comprised of a 44+ acre community park site. Access to this site is provided via La Media Road, which forms the eastern boundary of the Community Park.

The project area is currently undeveloped agricultural land. However, open space slope areas created to the north, east and west, will be fully irrigated and landscaped in conjunction with the development of the site. Wolf Canyon is a natural open space area located along the southern edge of Village 2, forming the eastern edge of Village 3 and surrounding the Village 4 Community Park on the northern and western edges. Wolf Canyon is part of the City of Chula Vista Multiple Species Conservation Plan (MSCP) Preserve and will remain undisturbed, natural open space. Wolf Canyon presents the most significant fire threat to this project, as vegetation will continue to grow unmanaged and increase the fire problem.

The site is basically flat, except for manufactured slopes (open space areas) on the perimeters. These range from 2:1 to 5:1. Wolf Canyon slopes are approximately 20-50%.

Average maximum summertime high temperature is 75 degrees F, in October. Extreme maximum in September/October is about 105 degrees f. Average wintertime high is 65 degrees F. Data is from the NWS, Western Regional Climate Center.

3. FIRE DEPARTMENT RESPONSE

The site is currently served by the Chula Vista Fire Department. The closest station is Station 7, at 1640 Santa Venetia, which is within Village 2. This station was funded through the payment of City of Chula Vista Public Facility Development Impact Fees.

The following Table summarizes the information regarding the existing fire stations, which would respond to this site:

Station #	Location	Total Staffing	Type of companies	Miles and driving time within Village
7	1640 Santa Venetia	7	1 engine co 1 ladder truck 1 future Batt. Chief	Worst case furthest distances: approx. 2.1 miles/ 5.12 minutes (assuming 25 MPH speed to Industrial Site #1; Santa Victoria west of Brinkeroff)

The fire station crews provide EMT level response. Private ambulance provides paramedic level service and transport.

The total response time from notification of an emergency via 911, to arrival on scene at the furthest point, is estimated at 7 minutes for the first fire engine.

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Station #	Total current daily/annual calls for Station 7	Estimated daily/annual calls generated by this village	Total estimated daily/annual calls (current & Village 2)
7	2.7/1000	1.4/524	4.1/1524

The Table reflects that this village should not generate a significant number of emergency calls. The estimated call generation is 1.4 per day. 85% of these calls will most likely be Medical Emergencies.

The staffing is adequate to support a fire in a sprinklered building, or initial attack at a residence. It is also adequate for an Advanced Life Support (paramedic) medical emergency. The response is adequate for a small vegetation fire with no wind, however, it is not adequate for a significant vegetation fire in fire weather conditions with wind. In that case, additional Fire agencies from surrounding communities would be dispatched.

The first alarm response to a vegetation fire on site would be 3 engine companies, 1 truck company, and 1 Battalion Chief.

STANDARD VEGETATION FIRE RESPONSE SCENARIOS: CHULA VISTA FIRE DEPARTMENT:

This table reflects the units dispatched to a vegetation fire in the City based upon the on-site risk. Wolf Canyon should be considered a High Wildland Risk. Other perimeter areas should be considered a Medium Wildland Risk.

Type of vegetation Fire Risk	Code	Engines	Ladder Trucks	Battalion Chiefs	Brush Fire Engine
Low Wildland risk	LW	1	0	Notify B-52	0
Medium Wildland Risk	MW	1	0	1	1
High Wildland Risk	HW	3	0	1	2

The first alarm response to a structural fire would be 3 engine companies, 1 truck company, 1 Battalion Chief, for a total crew of 14 firefighters. This size of crew can control a fire in a non sprinklered 3,600 sq foot, 1 story structure based on the fire flow determined by the National Fire Academy fire flow formula which results in a demand of 360 GPM (2 hose lines). The first alarm crews can handle a single unit fire in a building

up to 3 stories high. Beyond 3 stories, additional firefighters will be needed due to logistical problems in rescue and firefighting operations on upper floors.

There is adequate response time and acceptable proximity from the existing fire station to the furthestmost point in the project, based upon the risk. National insurance industry (ISO) standards for maximum distance from a fire station (1.5 miles) and national response time standards (4 minutes driving time to 90% of all calls) are substantially complied with. The national standard is to arrive at 90% of all structure fires and medical emergencies in 4 minutes driving time. It is critical to arrive at an emergency involving cessation of breathing or heart action, and take action within 5.5 minutes of the start of the emergency.

A future fire station is planned for the East Urban Center; east of Village 7. That station will further enhance response to Villages 2, 3 and 4 and will help mitigate instances of multiple queuing of calls as population increases.

As indicated above, the development will not generate a significant number of emergency calls. It is estimated that 85% of the calls will be medical emergencies.

4. FIRE HISTORY

There is no known significant fire history on site, other than controlled burns over the years. Any future fires will probably be based on the wind, terrain and fuel within Wolf Canyon.

The consultant inspected the site, photographed the site, and BEHAVE fire spread models were generated. The results are as follows:

5. RISK ASSESSMENT/FIRE SPREAD MODELS

When fully developed, the majority of the project area will be surrounded by major roadways and permanently landscaped and irrigated perimeter slopes which will buffer the residential neighborhoods from the roadways. La Media Road, a six-lane arterial, and associated permanently landscaped and irrigated slopes form the eastern boundary of the Village 4 Community Park. The Wolf Canyon drainage, a natural open space area, is adjacent to a portion of the southern project boundary of Village 2, the eastern boundary of Village 3 and the northern and western boundary of the Village 4 Community Park. Wolf Canyon is a part of the Otay Ranch Resource Management Preserve and the MSCP and is protected and managed under the provisions of the Otay Ranch Resource Management Plan (RMP) and the Chula Vista MSCP Subarea Plan. Based on Biological Resources mapping completed in 2002 by Dudek & Associates, the area is primarily covered in a combination of agricultural land, annual grass, Coastal sage scrub, mule fat scrub, sage/buckwheat and Maritime succulent scrub. Mule fat scrub dominates the riparian area, and coastal sage scrub and annual grass dominate the south aspect. In future years, as a result of the objectives of the MSCP, heavy, flammable, vegetation will grow

in this Preserve area, potentially increasing the current fire hazard. The modeling done for this plan attempts to reflect both the current risk and the future risk. The Wolf Canyon open space area presents the most significant wildland threat to this project. It should be noted that the MSCP provides guidelines for brush management activities that include the clearing of dead underbrush and thinning of canopies created by tall plants (MSCP Subarea Plan; Page 7-17). In addition section 7.4.4.3 “Emergency Brush Management” provides the following guidelines for additional permitted brush management activities:

“In the event that the City Fire Marshal determines an emergency situation exists, minimal additional brush management may be undertaken under the direction of the Fire Marshal. In such an emergency situation, the Fire Marshal will adhere to the Memorandum of Understanding between the Wildlife Agencies, California Department of Forestry, the San Diego Fire Chief’s Association, and the Fire District’s Association of San Diego County dated February 26, 1997” (MSCP Subarea Plan; Page 7-18)

BEHAVE fire spread models were generated for the site, by Scott Franklin, based on the vegetation present before development, and the proposed vegetation. The latest versions of the BEHAVE model system were used. Models were generated for summer fires and fall fires. Fuel models for areas on the north, east, and west are fuel model (FM) 1; grass less than 1’. The southern boundary is Fuel Model 1 with some Fuel Model 18, Sage/Buckwheat. It should be noted that on wet years or El Nino episode years, FM-1 will become FM-3; grass over 2’ tall. For that reason, both FM-1 and 3 were modeled. In addition, a sh-7 model; heavy 6’ high shrub, was generated. For planning purposes, FM-4; 6’ high chaparral, was employed as worst case. The following inputs replicate weather and fuel conditions of October 2003 in San Diego County, specifically the Cedar Fire.

Fall Fires:

Inputs to models:

Month: October

Time of day: 12 noon

One hour fuel moisture: 2%

Ten hour fuel moisture: 2%

100 hour fuel moisture: 3%

Live fuel moisture: 50%

20’ wind speed: 40 MPH; gusting to 50 MPH

Air temperature: 95 degrees f

Slopes; 33 to 50%

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Outputs of the models:

FM-1: light grass:

Rate of spread: 665 ch/hr or 9 MPH

Flame length: 13'

Spotting distance; 0.9 miles

FM 18: Sage/ Buckwheat

Rate of spread: 127 ch/hour or 2 MPH

Flame length: 32.1'

Spotting distance: 1.6 miles

FM 3: Grass over 2'

Rate of spread: 555 ch/hour or 7 MPH

Flame length: 32.6'

Spotting distance: 1.6 miles

FM sh-7: Heavy shrub; 6' high

Rate of spread: 4.75 MPH

Flame length: 42.5'

Spotting distance: 2.0 miles

FM 4: Chaparral; 6' high

Rate of spread: 13.39 MPH

Flame length: 75.2'

Spotting distance: 3.0 miles

Summary:

Because of extreme weather, all models display a probability of ignition of 100%. This means that out of 100 flaming firebrands flying down wind, 100 would ignite a new fire if landing in flammable fuel.

Summer Fire Models:

The following inputs were used for the summer fires:

1 hour fuel moisture: 3%

10 hour fuel moisture: 3-4%

100 hour fuel moisture: 5%

Live Herbaceous Moisture: 70%

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Live Woody Moisture: 70%
20 ft windspeed upslope: 15 MPH
Air temperature: 90 degrees F
Slope: 37%

Outputs:

FM 1; Light Grass:

Rate of spread: 0.6 MPH
Flame length: 5.6'
Spotting distance: 0.3 miles

FM 18: Sage/Buckwheat

Rate of spread: 0.6 MPH
Flame length: 19.2'
Spotting distance: 0.6 miles

FM 3: Grass over 2'

Rate of spread: 2 MPH
Flame length: 17.3'
Spotting distance: 0.6 miles

FM sh-7: Heavy shrub; 6' high

Rate of spread: 3.4 MPH
Flame length: 34.7'
Spotting distance; 1.8 miles

FM 4: 6' Chaparral

Rate of spread: 2.77 MPH
Flame length: 34.7'
Spotting distance: 0.9 miles

SUMMARY:

The models indicate that the estimated worst-case scenario is a fire in 6' high chaparral in Wolf Canyon open space areas during the fall. The flame lengths of 75.2' necessitate the 150' Fuel Modification Zone (2 times the flame length). The model indicates a very rapid rate of fire spread, 13.39 MPH, and high potential for igniting spot fires in any flammable vegetation in the development.

The estimated worst-case fire in Wolf Canyon open space areas during the summer would be in 6' high shrubs (sh-7). Flame lengths would be 34.7' and the rate of spread would be 3.4 MPH. The spotting distance downwind would be 1.8 miles (9,504').

Based on the models, airborne burning material from a fire in Wolf Canyon open space areas can spot into the development, or landscaped zones on the perimeter, and start additional fires. Therefore, it is critical that structures be properly protected from fire, and that all landscaping in the development be of a fire resistive type and properly maintained. In future years, the fuel in the open space areas will continue to grow and will increase the fire hazard beyond that predicted in the current models. It must be noted that BEHAVE models are estimates based on actual fire experience. Actual fire behavior can be greater or less intensive.

Based on the flame lengths in the area of the project, and the requirements of the Fire Marshal, a 150' Brush Management Zone should be provided at the perimeter adjacent to Wolf Canyon, with the first 50' permanently irrigated and the remaining 100' irrigated on a temporary basis to allow for plant establishment.. 90' Brush Management Zones are recommended elsewhere on perimeter slopes surrounding the project. In addition to the 150' setback for structures abutting Wolf Canyon, the perimeter structures abutting Wolf Canyon should be set back (built away from) from the slope where possible, with the objective of preventing direct flame contact upon a structure.

6. FIRE PROTECTION PLANNING AREAS

As this project is a unique combination of various uses and fire risks, it has been divided into two Fire Protection Planning Areas (FPPAs) for the purpose of organizing the recommendations set forth in this plan. Most of the project is comprised of graded relatively flat development areas with no natural vegetation cover. It presents more of an urban type risk than an Urban Wildland Interface (UWI) threat. However, there is a significant UWI threat along Wolf Canyon. Therefore, the entire village cannot be treated the same relative to fire protection requirements. There are certain baseline UWI Fire Protection requirements that apply to all areas due to the spotting potential; further, there are certain enhanced or focused requirements, which apply to both FPPAs.

The two UWI Fire Protection Planning Areas are depicted in Appendices E and F and are described below:

FPPA "A": The perimeter slopes along the southern edge of Village 2, eastern and southern edge of Village 3 and northern and western edge of the Village 4 community park. This area represents the primary fire threat to this project. Structures on the perimeter will need to be hardened against direct fire exposure and flying brands. This area will require the most intensified UWI fire protection for this project.

FPPA “B”: All other perimeter slopes equal to or greater than 10% gradient and an elevation change greater than 15 vertical feet, per specifications of the Fire Marshal.

Brush Management Zones must, at a minimum, start at the private property line. In some conditions, a portion of the private lot is within the Brush Management Zones. Consideration should be given to ensure slope stability and prevent erosion when determining plant palettes and maintenance programs for these areas.

7. PERIMETER DEFENSIBLE SPACE AND BRUSH MANAGEMENT ZONES

Based upon the fire history, fire risk assessment, on site inspection, review of maps, and generation of the BEHAVE models, the following brush management recommendations are provided with the objective of protecting structures from ignition due to a vegetation fire. Within FPPA “A,” the three Brush Management Zones begin at the MSCP Preserve Boundary and extend 150’ into the manufactured slopes/development area on the Wolf Canyon edge. The three 50 foot brush management zones within FPPA “A” are more fully described below. All brush management activities within FPPA “A” (Zone 3) must comply with the MSCP Subarea Plan requirement:

“...To the extent practicable, non-emergency brush management in zone 3 will be undertaken outside the bird breeding seasons (April 1 through June 31) in areas where breeding and/or nesting may occur.” (MSCP Page 7-17)

Within FPPA “B”, a 90’ Brush Management Zone (comprised of three 30 foot zones) is provided within FPPA “B” within the perimeter manufactured slopes with a slope gradient of 10% or greater adjacent to Olympic Parkway, Heritage Road, Rock Mountain Road, and La Media Road. FPPA “B” is more fully described below. All brush management zones must be installed in conjunction with adjacent construction and shall be maintained annually, prior to May 1, and more often as needed, on an ongoing basis.

In addition to the Brush Management Zones, recommendations are provided to private property owners, in Appendix D of this plan, for proper planting and maintenance on their lots. The developer cannot regulate such planting but recommends that it be done on an ongoing basis, and will provide each buyer with a private property owners fire safe landscaping guide. Proper fire safe planting should be done and proper, ongoing, maintenance should be done.

Maintenance of the perimeter slopes shall be funded through the Community Facilities District (CFD) and administered by the City of Chula Vista. This will assure long term maintenance of these areas.

A. Fire Protection Planning Area A: Wolf Canyon perimeter

Planting and irrigation requirements for Fire Protection Planning Area “A” are provided below. In addition, all materials listed in the Prohibited Plant List (Appendix A) are prohibited within all three brush management zones. An Approved Plant List for FPPA “A” is provided below.

Zone 1: 0-50’

- Irrigated zone
- No trees
- Plant height requirements:
 - 75% of the plant material may not exceed 18” in height
 - 25% of the plant material may not exceed 24” in height
 - Randomly placed CVFD approved succulent type plant materials may exceed the height limitations, provided they are spaced in groups of no more than 3 plants and a minimum of five feet away from described “clear access routes.”
- There shall be no hedges or shrubs

Zone 2: 51-100’

- Irrigated to ensure the establishment of vegetation intended to stabilize the slopes and minimize erosion. Irrigation to consist of above ground irrigation lines with sprinkler heads that spray 360 degrees. When the plants have become established, the sprinkler heads will be adjusted to spray only 180 degrees toward the upper 50 feet of the slope.
- Plant height requirements:
 - 75% of the plant material may not exceed 36” in height
 - 25% of the plant material may not exceed 48” in height
 - Randomly placed CVFD approved succulent type plant materials may exceed the height limitations, provided they are spaced in groups of no more than 3 plants and a minimum of five feet away from described “clear access routes.”
- No trees
- Shrubs may be planted in clusters not exceeding a total of 400 sq ft.
- A distance of no less than the width of the largest shrub’s mature spread shall be provided between each shrub cluster.
- Non-shrub avenues shall be included to provide a clear access route from toe of slope to top of slope and shall be a minimum width of 6’ and spaced a distance of 200’ lineal feet on center.
- When shrubs or other plants are planted underneath trees, the tree canopy shall be maintained at a height no less than three times the shrub or other plant’s mature height (break up any fire laddering effect).
- There shall be no hedges.

Zone 3: 101-150'

- Irrigated to ensure the establishment of vegetation intended to stabilize the slopes and minimize erosion. Irrigation will consist of above ground irrigation lines that will be completely removed upon plant establishment.
- Plant height maximum: 36"
- No trees
- Shrubs may be planted in clusters not exceeding a total of 400 sq ft.
- A distance of no less than the width of the largest shrub's mature spread shall be provided between each shrub cluster.
- Non-shrub avenues shall be included to provide a clear access route from toe of slope to top of slope and shall be a minimum width of 6' and spaced a distance of 200' lineal feet on center.
- There shall be no hedges.

Exceptions:

Trees may be placed within the Brush Management Zones in areas where public streets are included in the Brush Management Zone, including, but not limited to La Media Road on the perimeter of the project area and Paterna Drive, located along the Wolf Canyon edge. The following criteria must be followed:

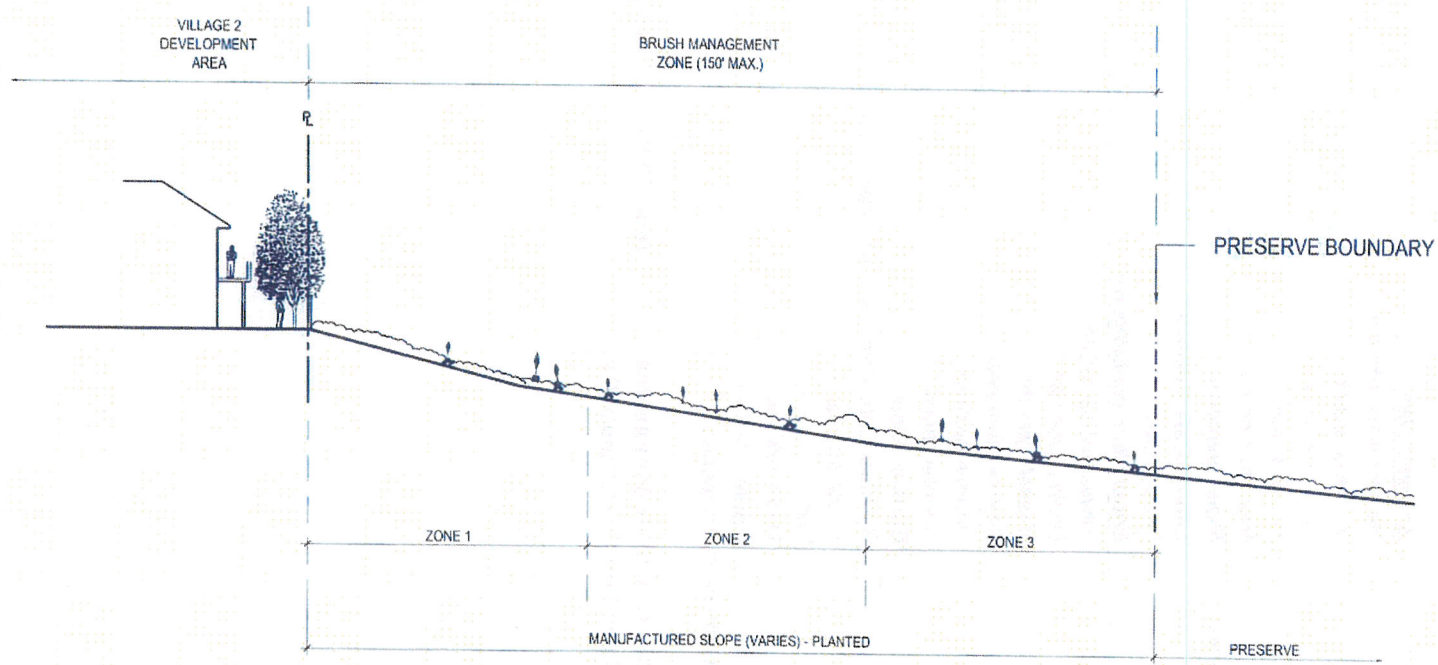
- Tree spacing to be 20' between mature canopies (30' if adjacent to a slope steeper than 41%)
- Trees must be limbed up 1/3 height of mature trees or 6', whichever is greater
- No tree canopies lower than 13'6" over roadways
- No trees shall be planted that are listed on the Prohibited Plan List (Appendix A)
- No flammable under story is permitted beneath trees
- No tree limbs/branches are permitted within 10' of a structure.

Fire Protection Planning Area “A” Approved Plant List

<u>Common Name</u>	<u>Scientific Name</u>
<i>Toyon*</i>	<i>Heteromeles arbutifolia</i>
<i>Bladderpod*</i>	<i>Isomeris arborea</i>
<i><no common name>*</i>	<i>Lycium andersonii</i>
<i>Hollyleaf cherry*</i>	<i>Prunus ilicifolia</i>
<i>Red berry*</i>	<i>Rhamnus crocea</i>
<i>Fuchsia flowering gooseberry*</i>	<i>Ribes speciosum</i>
<i>Goatnut*</i>	<i>Simmondsia chinensis</i>
<i>Bush sunflower</i>	<i>Encelia Californica</i>
<i>Golden yarrow</i>	<i>Eriophyllum confertiflorum</i>
<i>Common tarplant</i>	<i>Hemizonia fasciculata</i>
<i>Arroyo lupine</i>	<i>Lupinus succulentus</i>
<i>Purple needlegrass</i>	<i>Nassella pulchra</i>
<i>Blue eyed grass</i>	<i>Sisyrinchium bellum</i>
<i>Coast cholla</i>	<i>Opuntia prolifera</i>
<i>Coast prickly pear</i>	<i>Opuntia littoralis</i>
<i><no common name></i>	<i>Opuntia oricola</i>
<i>Snake cholla</i>	<i>Cylindropuntia californica var. californica</i>
<i>Mohave yucca</i>	<i>Yucca schidigera</i>
<i>Salt grass</i>	<i>Distichlis spicata</i>
<i>Our Lord's candle</i>	<i>Yucca whipplei</i>
<i>San Diego sunflower</i>	<i>Viguiera laciniata</i>

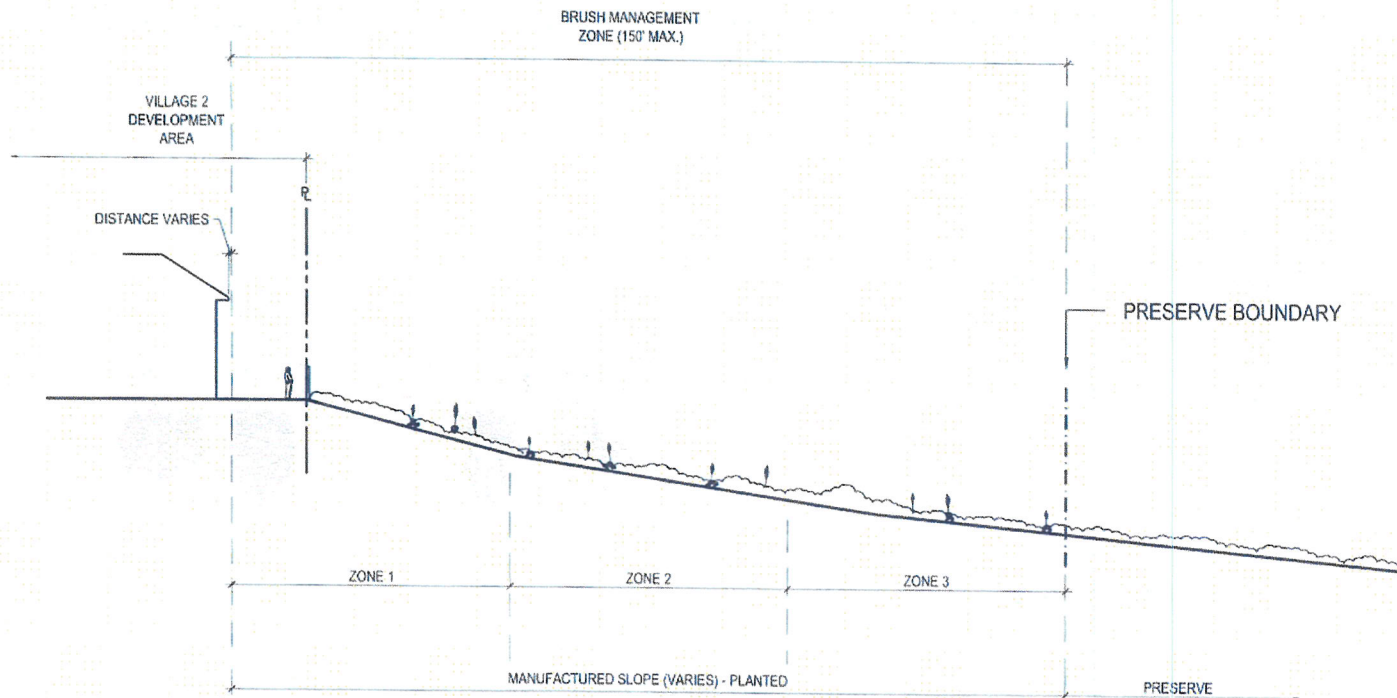
** Containers only, others can be hydroseeded*

Exhibits 1 - 6 depict the various conditions that exist within FPPA “A” within Village Two, Three and the Village Four Community Park.



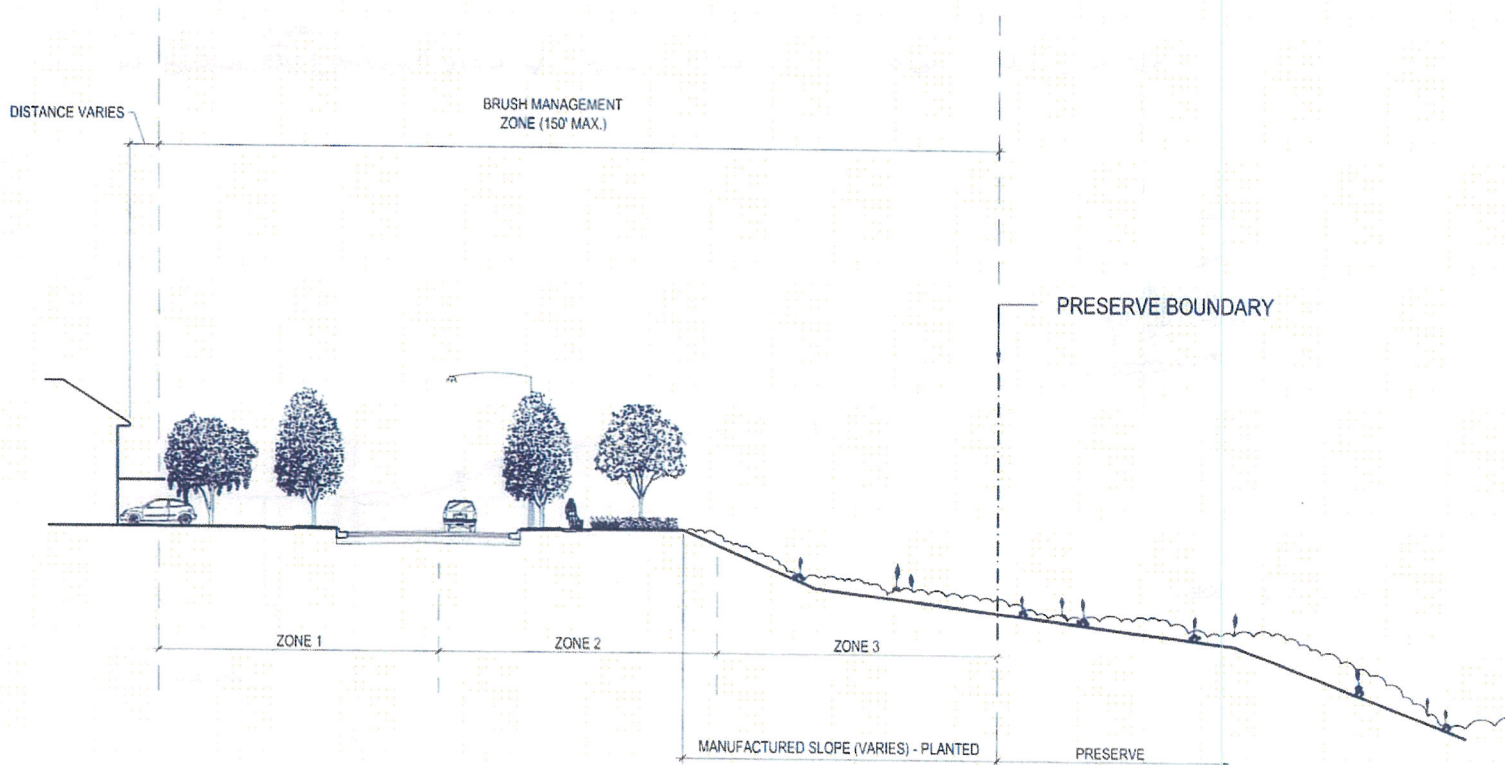
Fire Protection Planning Area "A" - Wolf Canyon, Preserve Boundary Condition 1
 Otay Ranch - Village 2

Scale: 1" = 20'



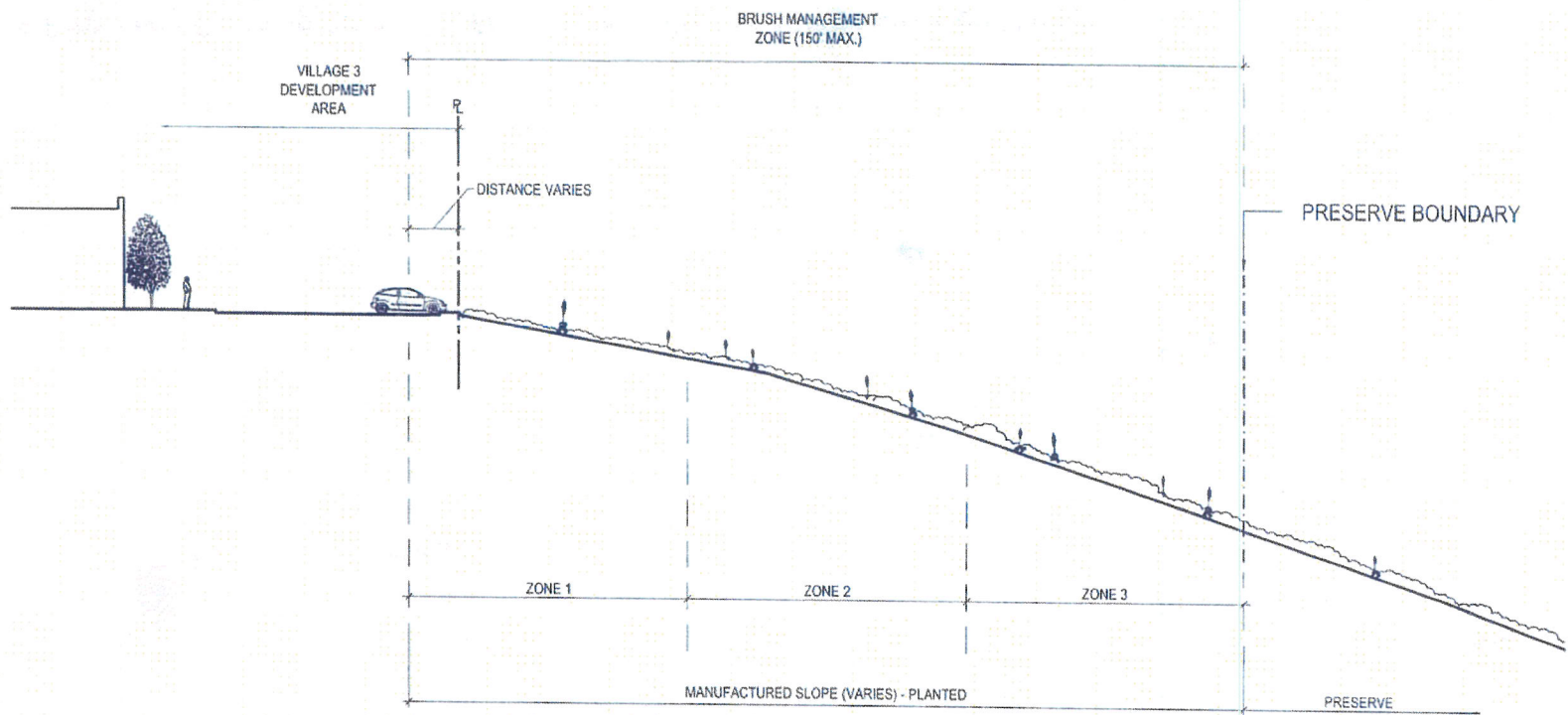
Fire Protection Planning Area "A" - Wolf Canyon, Preserve Boundary Condition 2
 Otay Ranch - Village 2

Scale: 1" = 20'



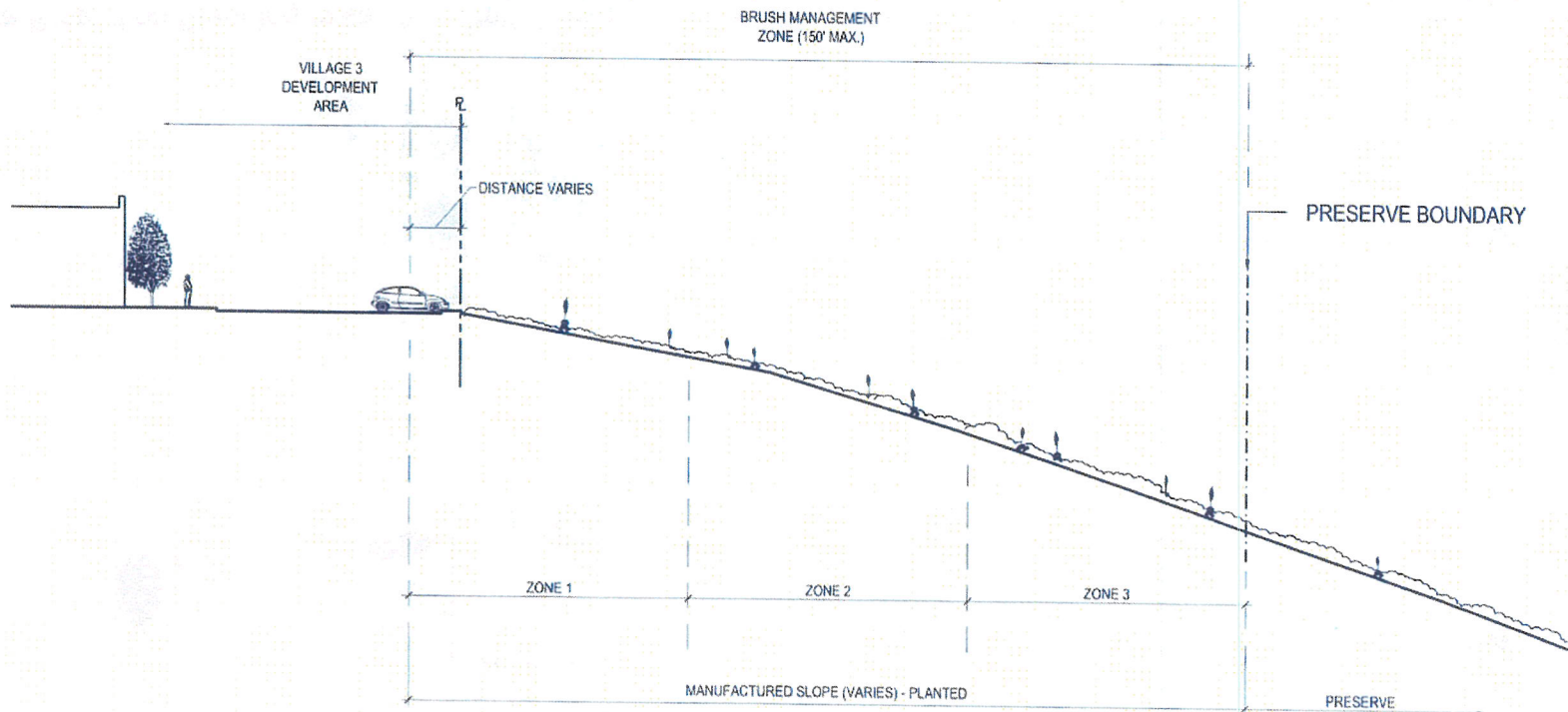
Fire Protection Planning Area "A" - Wolf Canyon, Preserve Boundary Condition 3
 Otay Ranch - Village 2

Scale: 1" = 20"



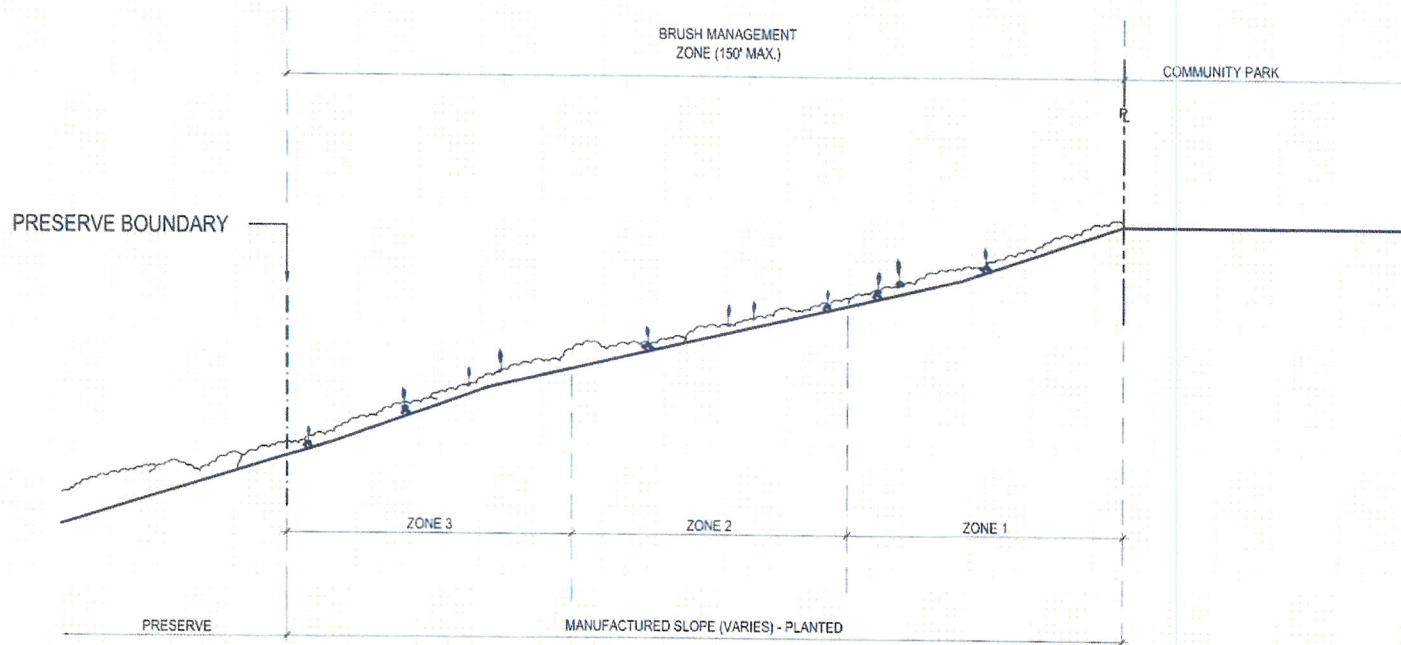
Fire Protection Planning Area "A" - Wolf Canyon, Preserve Boundary Condition 2
 Otay Ranch - Village 3 Industrial Park

Scale: 1" = 20'



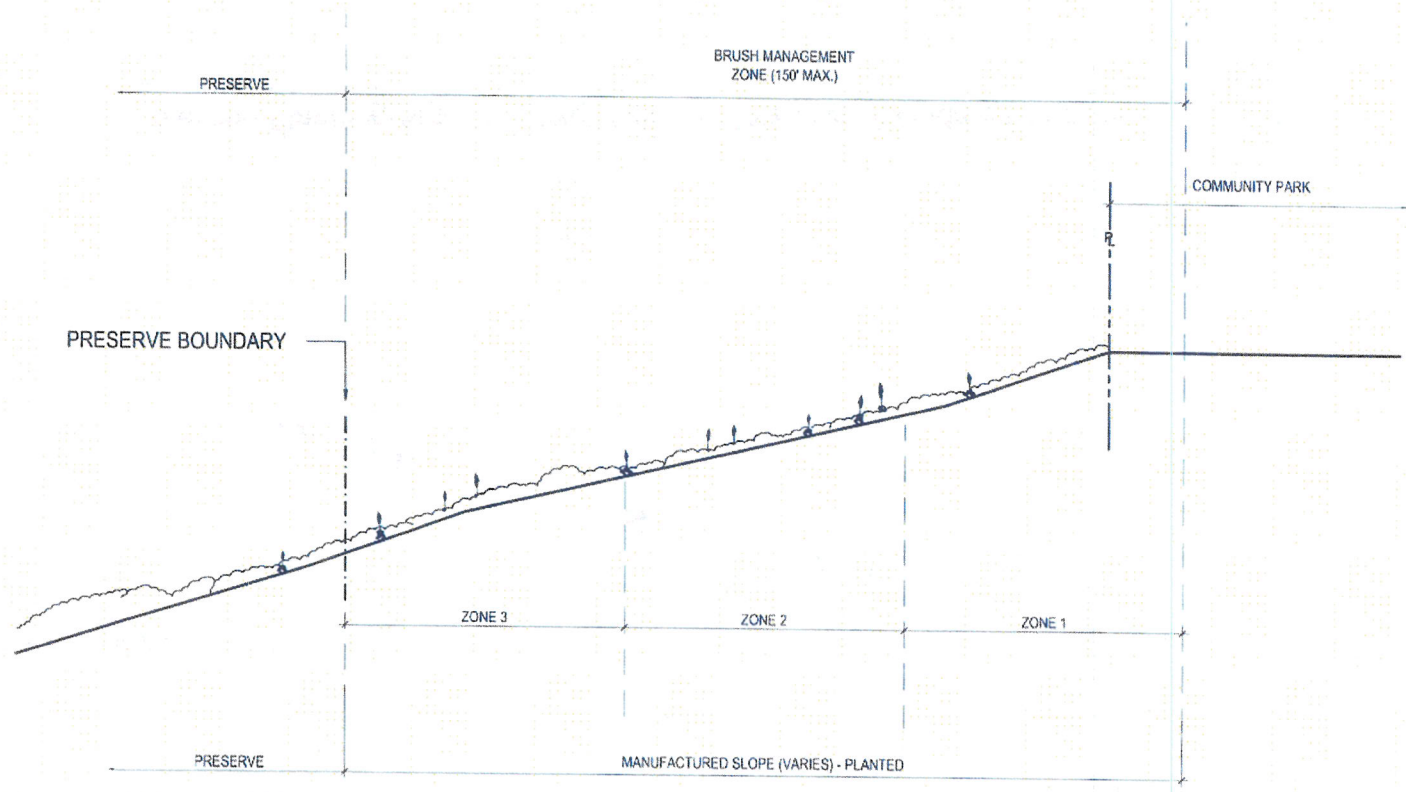
Fire Protection Planning Area "A" - Wolf Canyon, Preserve Boundary Condition 3
 Otay Ranch - Village 3 Industrial

Scale: 1" = 20'



Fire Protection Planning Area "A" - Wolf Canyon, Preserve Boundary Condition 1
 Otay Ranch - Village 4 Community Park

Scale: 1" = 20'



Fire Protection Planning Area "A" - Wolf Canyon, Preserve Boundary Condition 2
 Otay Ranch - Village 4 Community Park

Scale: 1" = 20'

B. Fire Protection Planning area “B”; Other Perimeter Slopes

Planting and irrigation requirements for Fire Protection Planning Area “B” are provided below. In addition, all materials listed in the Prohibited Plant List (Appendix A) are prohibited within all three brush management zones. An Approved Plant List for FPPA B is also provided below.

Zone 1: 0-30’

- Irrigated zone
- No trees
- Plant height: 0-18” (including groundcover and vine masses).
- There shall be no hedges or shrubs

Zone 2: 31-60’

- Temporarily irrigated zone, for establishment of new vegetation only
- Existing plant material on the prohibited plant material list shall be removed from the site.
- The existing plant material to remain shall be pruned and maintained in compliance with the approved Village 2 Fire Protection Plan Area ‘B’, Zone 2 requirements, as described below.
- Plant height: max 24” (including irrigated shrubs, groundcover and vine masses) with 75% of the shrubs under 18 inches and the remaining 25% of the shrubs under 24 inches.
- No trees within 45’ horizontally from top of slope.
- Tree spacing: 20’ between mature canopies (30’ if slope 41%+)
- Trees may be planted in clusters of no more than 3.
- Shrubs may be planted in clusters not exceeding a total of 400 sq ft.
- A distance of no less than the width of the largest shrub’s mature spread shall be provided between each shrub cluster.
- Non-shrub avenues shall be included to provide a clear access route from toe of slope to top of slope and shall be a minimum width of 6’ and spaced a distance of 200’ lineal feet on center.
- When shrubs or other plants are planted underneath trees, the tree canopy shall be maintained at a height no less than three times the shrub or other plant’s mature height (break up any fire laddering effect).
- There shall be no hedges.
- Trees must be limbed up 1/3 height of mature trees or 6’, whichever is less.

Zone 3: 61-90’

- Temporarily irrigated zone, for establishing new vegetation only

- Existing plant material on the prohibited plant material list shall be removed from the site.
- The existing plant material to remain shall be pruned and maintained in compliance the approved Village 2 Fire Protection Plan Area ‘B’, Zone 3 requirements, as described below.
- Plant height: max 24” (including irrigated shrubs, groundcover and vine masses) with 75% of the shrubs under 18 inches and the remaining 25% of the shrubs under 24 inches.
- Tree spacing: 20’ between mature canopies (30’ if slope 41%+)
- Trees may be planted in clusters of no more than 3.
- Shrubs may be planted in clusters not exceeding a total of 400 sq ft.
- A distance of no less than the width of the largest shrub’s mature spread shall be provided between each shrub cluster.
- Non-shrub avenues shall be included to provide a clear access route from toe of slope to top of slope and shall be a minimum width of 6’ and spaced a distance of 200’ lineal feet on center.
- When shrubs or other plants are planted underneath trees, the tree canopy shall be maintained at a height no less than three times the shrub or other plant’s mature height (break up any fire laddering effect).
- There shall be no hedges.
- Trees must be limbed up 1/3 height of mature trees or 6’, whichever is less.

Fire Protection Planning Area “B” Approved Plant List

Trees

<u>Common Name</u>	<u>Scientific Name</u>
<i>London plane tree</i>	<i>Plantanus acerifolia 'bloodgood'</i>
<i>Australian willow</i>	<i>Geijera parviflora</i>
<i>Coast live oak</i>	<i>Quercus agrifolia</i>
<i>African sumac</i>	<i>Rhus lancea</i>
<i>Brisbane box</i>	<i>Tristania coniferta</i>
<i>Jacaranda</i>	<i>Jacaranda mimosifolia</i>
<i>California sycamore</i>	<i>Platanus racemosa</i>
<i>Chilean mesquite</i>	<i>Prosopis chilensis</i>
<i>Black willow</i>	<i>Salix gooddingii</i>
<i>Pink Crape Myrtle</i>	<i>Lagerstroemia indica 'biloxi'</i>
<i>Cape chestnut</i>	<i>Calodendrum capense</i>
<i>Golden medallion tree</i>	<i>Cassia leptophylla</i>
<i>Chitalpa</i>	<i>Chitalpa tashkentensis</i>
<i>Chinese flame tree</i>	<i>Koelreuteria bipinnata</i>
<i>Firewheel tree</i>	<i>Stenocarpus sinuatus</i>
<i>Chinese evergreen elm</i>	<i>Ulmus parvifolia 'Drake'</i>
<i>Bottle tree</i>	<i>Brachychiton populneus</i>
<i>American sweet gum</i>	<i>Liquidamber styraciflua 'festival'</i>

*Fire Protection Plan; Otay Ranch Villages 2, 3 and a portion of 4
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Shrubs/Ground cover

<u>Common Name</u>	<u>Scientific Name</u>
<no common name>	<i>Myoporum 'Pacificum'</i>
<no common name>	<i>Myoporum parviflorum 'Putah creek'</i>
<no common name>	<i>Photinia fraseri</i>
California meadow sedge	<i>Carex pansa</i>
California Wild Grape	<i>Vitis californica</i>
Carmel creeper	<i>Ceanothus griseus horizontalis</i>
Century Plant	<i>Agave attenuata</i>
Cistus 'Sunset'	Rockrose
Day lily	<i>Hemerocallis hybrids</i>
Dwarf flax	<i>Phormium tenax 'bronze baby</i>
Dwarf Coyote Bush	<i>Baccharis pilularis 'Twin Peaks'</i>
Dwarf English lavender	<i>Lavandula angustifolia 'compacta'</i>
Dwarf tall fescue	Marathon III
Flax	<i>Phormium spp.</i>
Foothill Yucca	<i>Yucca whipplei</i>
Fortnight lily	<i>Dietes bicolor</i>
Fortnight lily	<i>Dietes vegeta</i>
Indian hawthorn	<i>Rhaphiolepis indica 'ballerina'</i>
Indian hawthorn	<i>Rhaphiolepis indica 'majestic beauty'</i>
Japanese privet	<i>Ligustrum japonicum 'texanum'</i>
Lavender starflower	<i>Grewia occidentalis</i>
Lily of the Nile	<i>Agapanthus africanus 'blue'</i>
Limonium perezii	Sea Lavender
Mohave Yucca	<i>Yucca schidigera</i>
Pink day lily	<i>Hemerocallis hybrid 'pink parfait'</i>
Pink melameuca	<i>Melaleuca nesophila</i>
Pink powder puff	<i>Calliandra Haematocephala</i>
Prostrate Natal Plum	<i>Carissa macrocarpa 'green carpet'</i>
Purple Nightshade	<i>Solanum xantii</i>
Rosemary (dwarf)	<i>Rosmarinus officinalis "Huntington Blue"</i>
Star jasmine	<i>Trachelospermum jasminoides</i>
Toyon	<i>Heteromeles arbutifolia</i>
Violet trumpet vine	<i>Clytostoma callistegiodes</i>
White lily of the Nile	<i>Agapanthus africanus 'rancho white'</i>
Wild Lilac	<i>Ceanothus 'Joyce Coulter'</i>

Hydroseed Mix

<u>Common Name</u>	<u>Scientific Name</u>
Beach Evening Primrose	<i>Camissonia cheiranthifolia</i>
Blue-eyed grass	<i>Sisyrinchium bellum</i>
California blue bells	<i>Phacelia campanularia</i>
California Poppy	<i>Eschscholzia californica</i>
Coastal Goldenbush	<i>Isocoma menziesii</i>

*Fire Protection Plan; Otay Ranch Villages 2, 3 and a portion of 4
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<i>Deerweed</i>	<i>Lotus scoparius</i>
<i>Dwarf Goldfields</i>	<i>Lasthenia californica</i>
<i>Mugwort</i>	<i>Artemisia douglasiana</i>
<i>Mulefat</i>	<i>Baccharis salicifolia</i>
<i>Poverty weed</i>	<i>Iva hayesiana</i>
<i>Purple needlegrass</i>	<i>Nassella pulchra</i>
<i>Showy evening primrose</i>	<i>Oenothera speciosa</i>
<i>Shrubby Plantain</i>	<i>Plantago semibaccata</i>
<i>Sprangletop</i>	<i>Leptochloa uninervia</i>
<i>Sticky monkeyflower</i>	<i>Mimulus aurantiacus puniceus</i>
<i>Western ragweed</i>	<i>Ambrosia psilostachya</i>
<i>Woolly Plantain</i>	<i>Plantago ovata</i>
<i>Yarrow</i>	<i>Achillea millefolium</i>

Exhibits 7 and 8 depict conditions along the major arterial roadways.

*Fire Protection Plan; Otay Ranch Villages 2, 3 and a portion of 4
Hunt Research Corporation*

La Media Road Brush Management Section

*Fire Protection Plan; Otay Ranch Villages 2, 3 and a portion of 4
Hunt Research Corporation*

Olympic Parkway, Brush Management Section

8. OTHER BRUSH MANAGEMENT

Consideration should be given to ensure slope stability and prevent erosion when determining plant palettes and maintenance programs for these areas.

A. Roadside Brush Management Zones

- Roadside Brush Modification Zones shall be cleared of any flammable vegetation including flammable shrubs and trees.
- No unbroken canopies.
- Grass shall be mowed to 4”.
- Single specimens of trees, fire resistive shrubs, or cultivated ground cover such as green grass, succulents or similar plants used as ground covers may be used, provided they do not form a means of readily transmitting fire.
- All roads in the development will have vegetation clearance of flammable vegetation on each side.

Trees may be placed within the Roadside Brush Management Zones in areas where public streets are included in the Brush Management Zone, such as La Media Road on the perimeter of the project area and Paterna Drive, located along the Wolf Canyon edge. The following criteria must be followed:

- Tree spacing to be 20’ between mature canopies (30’ if adjacent to a slope steeper than 41%)
- Trees must be limbed up 1/3 height of mature trees or 6’, whichever is greater
- No tree canopies lower than 13’6” over roadways
- No trees shall be planted that are listed on the Prohibited Plan List (Appendix A)
- No flammable understory is permitted beneath trees
- No tree limbs/branches are permitted within 10’ of a structure.

B. Trail Brush Management

- A 10’ Brush Modification zone is required on both sides of hiking trails.
- Fire resistive vegetation should be utilized, unless existing natural vegetation needed for soil and slope stability and to prevent erosion.
- Grasses must be kept mowed to 4” or less.
- Certain trees may be planted if they are not prohibited in this plan. Approved trees include Coastal Live Oak, Engelmann Oak, and Sycamore.
- Trees, within Brush Management Zones, must be properly spaced and limbed up with no flammable under story.

C. Parks, open space, etc.

Fire Safe Brush Management is recommended within parks and open space areas, but only required by City in the Brush Management Zones shown on Landscape Architect's drawings in the Appendices E and F of this plan.

- Flammable vegetation must be removed.
- Grasses kept mowed to 4".
- Types and spacing of trees, plants and shrubs, to comply with the same criteria as Fire Protection Planning Area "B" criteria.
- Plant materials included in the Prohibited Plant List (Appendix A) are prohibited in this area.
- Areas shall be maintained free of down and dead vegetation.
- Flammable vegetation and flammable trees shall be removed and prohibited.
- Trees to be properly limbed and spaced and shall not be of a type prohibited in this plan.

D. Vacant Parcels and lots

- Lots that are vacant will not be required to have brush management until construction begins.
- Prior to issuance of a building permit for construction, grading, digging, installation of fences, or other construction, the outermost 30' of the parcel is to be maintained as a Brush Management Zone per the CVFD Fire Code.
- Flammable vegetation shall be reduced by 60% in this zone.
- Dead fuel, ladder fuel (fuel which can spread fire from ground to trees), and downed fuels shall be removed and trees/shrubs shall be properly limbed, pruned and spaced per this plan.
- The remainder of the Brush Management Zones required for the particular parcel shall be installed and maintained prior to flammable material being brought to any lot under construction.

E. Environmentally sensitive areas/Riparian areas

In any environmentally sensitive areas that contain sensitive habitat, cultural sites, riparian areas, biological buffer areas, MSCP Preserve areas, debris basins etc, permission will be needed from the City of Chula Vista, and the appropriate resource agencies (California Department of Fish and Game, U.S. Fish and Wildlife Service, Army Corps of Engineers) prior to any brush management activities. This project is directly adjacent to Wolf Canyon, a part of the MSCP Preserve. Therefore any proposed brush management activities within FPPA "A", Zone 3, must adhere to the requirements outlined in the MSCP Subarea Plan.

F. Alternative Methods

The developer, or private lot owner may submit a site specific risk assessment and detailed brush management plan, to the CVFD, proposing alternative methods of fire protection and providing justification for less than the recommended brush management zones, if there is a practical difficulty, or environmental constraint, in providing the entire size of the necessary brush management zone.

G. Private Lots

Per the Fire Marshal, the Brush Management Zones apply to the perimeter slopes described above and do not apply to private lots. However, the Fire Protection Consultant has provided recommendations, in Appendix D, for private property owners (including all types of occupancies) within the project area regarding how to select fire safe vegetation and how to plant and maintain the vegetation on their lots in a fire safe manner. Recommendations for construction of decks, and other ancillary structures, on perimeter lots facing perimeter Brush Management Zones are also included. In addition, it is recommended that none of the plant materials listed in the “Prohibited Plant List” (Appendix A) in this plan be planted on private lots. Developer will provide that list to all buyers in a private property owners’ guide to fire safe brush management on private lots. Private lot owners located adjacent to the Chula Vista MSCP Preserve are prohibited from conducting any brush management activities outside their private property.

9. UNDESIRABLE PLANTS

Certain plants are considered to be undesirable in the landscape due to characteristics that make them highly flammable. These characteristics can be physical or chemical.

The plants included in the Prohibited Plant List (Appendix A) are unacceptable from a fire safety standpoint, and should not be planted in any slopes, brush management zones, open space, including perimeter open space around this tract (all sides), private lot brush management zones, or on the perimeter streets in the tract. An exception may be granted by the Fire Marshal for the open space slopes within FPPA “B” along roads where there is no UWI threat. For example, in those areas, Torrey Pines can be used if irrigated and spaced 40’ between canopies. Silver Dollar Eucalyptus or Eucalyptus Citriodora (Lemon Scented Gum) may be used if it is irrigated and spaced 20’ between canopies.

The Prohibited Plant List (Appendix A) was prepared in cooperation with licensed Landscape Architects and has previously been reviewed and approved by the Fire Protection Consultant and the Chula Vista Fire Marshal.

10. ANNUAL AND ONGOING BRUSH MANAGEMENT

An Open Space Maintenance District (“OSD) and Community Facilities District (“CFD”), will implement ongoing maintenance of designated common areas (not

otherwise maintained by a Homeowners Association entity), roadsides, Brush Management Zones, retention basins, open space, streetscapes, medians, planters, etc., within Fire Protection Planning Areas A and B in compliance with this plan and City requirements. Consideration must be given to ensuring slope stability and preventing erosion through appropriate maintenance activities.

11. CONSTRUCTION PHASE BRUSH MANAGEMENT

Brush management in all common areas, medians, planters, roadsides, parks, etc shall be done as required in this plan at the start of, and throughout the construction phase. Brush management shall be done on private lots prior to work beginning on those lots and prior to any combustible construction materials being brought on site. Adequate fuel breaks shall be created around all grading, site work and other construction activities in areas where there is flammable vegetation.

12. ACCESS ROADS AND FIREFIGHTER WALKWAYS

It is understood that all streets and alleys will comply with all current requirements of the City of Chula Vista City Council and all City departments, including the Fire Department. In addition, the CVFD, Planning Dept. and Engineering Dept. review/approve all site plans for Multi-family neighborhoods and the project is taken to Design Review Committee as well. All roads shall meet City and Fire Department standards as approved for the Otay Ranch. Access roads, not including alleys, will comply with Chula Vista Fire Department Fire Code Section 902.2. In addition, there are 20' wide (drivable width) alleys between various homes throughout the project. Alleys will be posted "No Parking-Fire Lane."

All addressing of structures and roads shall meet City standards and be approved by Fire Department.

Firefighter foot access to the Wolf Canyon area will be provided at the ends of cul-de-sacs at Ortega Street, Oramus Court, Dome Rock Place, Copper Creek Court, La Cumbre Avenue and Cota Court and along Paterna Drive where it is a single-loaded residential street along the Wolf Canyon edge. Direct firefighter access will also be provided at the southern edge of the Community Purpose Facility (CPF-3) site located along the Wolf Canyon Edge. The exact location of access gates for firefighter foot access will be provided on the Village 2 Landscape Master Plan. Locking mechanisms on access gates shall be subject to review and approval by the Fire Marshal. Alternative firefighter foot access may be proposed, but is subject to approval by the City's Fire Marshal.

13. WATER SUPPLY AND FIRE FLOW

Wherever possible, approved emergency fire truck access will be provided to within 50' of any community swimming pools. A drafting hydrant shall be provided at these locations, and will be connected to the drain system.

Fire hydrants:

- This development will be served by an extension of the Otay Municipal Water District water distribution system and will have mains, hydrants, and stored water. Fire flows have already been addressed in the SPA plan, Water Master Plan and Otay Water District Sub-area Master Plan and have been approved by the City and/or Otay Water District as being adequate to serve the project area.
- The minimum required fire flow will be 1500 GPM for 2 hours at least 20 PSI, and shall provide pressures required to supply hydrants and fire sprinklers during periods of maximum peak domestic demand.
- Pressure demands for fire sprinklers will be higher.
- Fire flow demands for commercial and industrial occupancies, schools or multi family residences may be higher, based on type of construction and size, per Fire Code Table A-111-A-1.
- The fire flow is based upon all new Type 5 NR structures being less than 3,600 sq ft, or being equipped with fire sprinklers, per Table A-111-A-1.
- Fire hydrants shall be of an approved type and have one 4" outlet and one 2.5" outlet, unless otherwise specified by Fire Chief. Fire hydrants will have a 3' by 3' gravel (for dry barrel hydrant) or concrete pad at base for weed control. Reflective blue dot hydrant markers will be located in the center of the road to indicate location of a hydrant.

Hydrant spacing:

Fire hydrants in residential areas shall be located at 500' spacing; beginning at the intersection of each residential street with homes fronting. It is recommended that hydrants be on the right (driving) side of the street. A hydrant should be located at each intersection and at each entrance to cul-de-sac bulb

- Hydrants shall be installed to provide alley coverage. The exact spacing shall be 600 feet on center. The Otay Water District shall be consulted in order to provide adequate maintenance access to hydrants serving alleys.
- Hydrants on roads where there are no structures will be 1,000' apart, and will be alternated on each side of street.
- Hydrants in any commercial or industrial area, including multi family complexes, and high density residential, shall have 300' on center spacing.

- Each fire hydrant shall have a red curbed area posed “No Parking – Fire Lane” for fire engines to pull out of traffic to connect to fire hydrants.
- Multi family developments or schools may require an on site hydrant, if the distance from a hydrant on the public street exceeds 150’.
- Actual placement of hydrants shall be subject to approval of the Fire Department.
- Hydrants shall be provided at the ends of cul-de-sacs and other points along the Wolf Canyon edge in locations where firefighter foot access is provided.
- Horizontal dry standpipes with a 2.5” diameter gated fire hose outlet, which can flow 250 GPM, will also be provided on the Wolf Canyon side of homes abutting the canyon. They shall be spaced at approximately 1,000’ intervals as measured starting at the fire hydrants at the locations where firefighter foot access is provided (see Section 12 above). Fire Department pumper connections shall be located at the closest fire hydrant, in order to allow the Fire Department to pump water into these lines. The actual design and location of the standpipes shall be shown on the Village 2 Landscape & Irrigation Plans and shall be subject to approval of the Fire Marshal.

14. FIRE PROTECTION SYSTEMS AND EQUIPMENT

Explanatory Note: All fire extinguishing systems shall be installed per Chula Vista Fire Department requirements and NFPA standards.

- All structures of any type exceeding 3,600 sq ft, three story residences, multi family dwellings or condominium complexes over 5 units, or 3 stories high, and schools, commercial and industrial buildings, shall be equipped with fire sprinkler systems. The State Fire Code Section 1003.2.2 requires that all structures (except for F-2 occupancies and open parking garages) with 30 or more occupants on any floor 55’ or more from lowest level of fire truck access, schools, and any structure beyond 150’ from an approved access road, be equipped with internal Fire Sprinklers. Sprinkler systems shall meet the appropriate NFPA sprinkler standard for the type of occupancy. Single-family dwellings will be 13-D systems.
- Any structures of any occupancy type and size (greater than 200 sq ft) on the perimeter abutting Wolf Canyon shall have fire sprinklers, due to the fire risk and the potential for increased fuel load in the open spaces in future years.
- Multi family residential buildings shall be equipped with NFPA 13-R or 13 sprinkler systems pursuant to CVFD requirements.
- All non-residential occupancies shall be equipped with NFPA 13 sprinkler systems.

- The fire sprinklers shall be designed with coverage to include garages, enclosed porches and enclosed patios, subject to CVFD approval. . Sprinkler coverage should be considered for attics to extinguish burning embers, which can enter through vents.
- Fire Sprinklers in small, uninhabitable, detached, structures may be excluded by the Fire Chief based on type of construction and distance from other buildings.
- The water supply shall be per the appropriate NFPA sprinkler standard and the CVFD requirements based on the type of occupancy.
- Sprinkler systems in all buildings other than single family dwellings shall be electronically supervised to an approved 24 hour answering point, where a trained person is present who can verify alarm and call 911.
- Sprinkler systems for buildings other than detached single-family dwellings shall have a fire department connection at the street in front of the building, and a fire hydrant within 25' of the fire department connection.
- All residential units shall have smoke detectors as required by the Building Code.
- Fire Alarm systems shall be as required by the City Fire Code for apartment houses 3 or more stories in height or containing 16 or more dwelling units (unless sprinklered OR unless not over 2 stories in height with all units separated by 1 hour walls and if each unit has an exit directly to outside).

15. IGNITION RESISTANT CONSTRUCTION REQUIREMENTS FOR STRUCTURES

In addition to City of Chula Vista requirements, the following construction requirement shall be implemented in Village 2. Detailed architectural and construction plans addressing these requirements are subject to review and approval by the Director of Planning and Building.

A. ALL STRUCTURES THROUGHOUT THE PROJECT

- Structures over 3,600 sq ft, shall have residential fire sprinklers due to capabilities of first alarm fire forces, and in order to allow fire flow of 1500 GPM, per Fire Code Appendix 111-A. Any three story residences shall be equipped with an NFPA 13-D system with 4 head calc.
- All roofs shall be approved Class A assemblies and subject to approval of the Assistant Director of Building Housing and Fire Marshal. The end of any Spanish tile roofs shall be blocked to prevent bird's nests. Any roofs with a profile which

- allows a gap between roof covering and roof deck shall be fire stopped at the ends. All roof edges and valleys shall be constructed so there are no gaps.
- Vents shall have louvers over them, and shall be covered with a maximum ¼” mesh per code. Vent openings shall not exceed 144 sq” each, and shall be designed to prevent intrusion of sparks and burning debris
 - Glazing on all structures shall be double pane. All skylights shall be tempered.
 - All exterior walls on any structure of any kind anywhere in this tract shall be approved stucco or non-combustible Hardy type Board. No combustible wall coverings, light flammable wood shall be permitted. Walls shall comply with Chula Vista Fire and Building Codes.
 - Approved spark arrestors shall be provided on all chimneys, stovepipes and flues. Arrestors shall be visible from grade.

B. STRUCTURES OF ANY TYPE OCCUPANCY AND SIZE ON PERIMETER ABUTTING WOLF CANYON

1. Fire Sprinklers shall be designed and installed per the appropriate NFPA sprinkler standard and CVFD standards. Residential Protection shall include enclosed porches and garages.
2. All roofs shall be approved Class A assemblies and subject to approval of the Assistant Director of Building Housing and Fire Marshal. The end of any Spanish tile roofs shall be blocked to prevent bird’s nests. Any roof where the profile allows a gap between the roof covering and roof deck shall have the ends fire stopped. All roof edges and valleys shall be constructed so there are no gaps.
3. Eaves on perimeter structures shall be boxed in and be of 1 hour fire resistive construction, or non-existent. Fascias are needed and are to be protected on backside by 1 hour rated construction or 2” nominal dimension lumber. No vent openings in eaves, eave overhangs, soffits, rakes, between rafters at eaves, or in other overhang areas
4. Glazing facing Wolf Canyon, on perimeter structures, shall be tempered double pane or tempered. Skylights shall be tempered.
5. Plastic or vinyl window frames shall comply with the following:
 - Frame and sash are comprised of vinyl materials with welded corners
 - Metal reinforcements in the interlock area

- Glazed with insulated glass or tempered
 - Frame and sash profiles are certified in AAMA lineal certification program (verified with either an AAMA product label or certified products directory)
 - Certified and labeled in accordance with ANSI or other approved agency standard.
 - Comply with ANSI/AAMA/NWDA 101/LS 2-97 structural requirements, as required by County Fire Code.
6. Exterior walls on perimeter structures shall be either one-hour rated stucco assembly or other approved one-hour rated walls on exterior side. No combustible wall coverings. No wood. Walls to comply with Chula Vista Fire and Building Codes. No wood or plastic garage doors.
 7. Vents shall have louvers over them, and be covered with a maximum ¼” mesh per code. Vent openings shall not exceed 144 sq” each type and designed to prevent intrusion of sparks and burning debris. No vents in soffits, eave overhangs, rakes, between rafters at eaves, or in other overhang areas. No vents should face Wolf Canyon. No turbine vents. Vents shall be subject to approval of the Building Official and the Fire Chief.
 8. No paper or plastic faced insulation in ventilated spaces.
 9. Gutters and downspouts shall be non combustible, and shall be designed to reduce accumulation of litter and debris that contribute to roof edge ignition
 10. Exposed piping, except plumbing vents, shall be non combustible
 11. Decks, balconies, carports, patio covers, gazebos, and similar architectural appendage and ancillary structures shall not overhang slopes and shall be 1 hour rated heavy timber or approved non-combustible, and not made of a material which could ignite, melt or otherwise fail during a fire, or fail under the weight of a firefighter during a fire. The underside shall be enclosed on all sides. Deck or patio cover components attached to any structure shall not increase the risk of fire spread to the structure, and shall maintain the fire resistive integrity of the wall.
 12. Structures shall be set back 30’ from edge of slope, wherever possible.
 13. Fences on perimeter lots shall not be wood, and Property line fencing shall be solid block, solid masonry or solid steel. Heavy timber split rail, or heavy timber, fences may be used outside of the fuel modification zones,

and away from slopes above Wolf Canyon. No fencing or railings shall be plastic or vinyl.

14. Rear yard fencing on lots backing or siding on Wolf Canyon shall be 6' solid (combination 2' masonry block with 4' fire rated glass about). Open metal fencing is acceptable in perimeter areas where a single-loaded residential street is incorporated into the Brush Management Zone.
15. Wherever possible, structures shall have approved garden hose connections on all sides of structures. Connection to have 50' of garden hose and a spray nozzle attached. A metal Sign to be permanently posted on the wall above faucet: " Fire hose; do not remove."
16. Approved spark arrestors on chimneys and flues shall be visible from grade.
17. No firewood, lumber, or LPG tanks shall be stored within 30' of structure

16. SUMMARY

This plan is limited to addressing the requirements of the Chula Vista Fire Marshal for this project.

All buyers of structures which could be exposed to spotting from Wolf Canyon should receive notice of the possible fire hazard threat from Wolf Canyon in Village 2, and should be given a copy of this report. This development will comply with all applicable requirements of the City of Chula Vista.

As Fire is dynamic and unpredictable, this plan does not guarantee that a fire won't occur or won't cause property damage, injury or loss of life. No expressed or implied warranties are made as to the adequacy or effectiveness of the recommendations and requirements in this plan in all situations.

Architecture, landscape architecture, and engineering are out of the scope of this plan. All detailed plans for architecture, landscaping, and engineering, and all plant palettes, shall be in compliance with the concepts in this plan and shall be submitted to the Fire Marshal for review and approval. In the event there is a practical difficulty, legal environmental constraint or other legal constraints, or engineering/architectural difficulties in complying with this plan, alternative methods of compliance may be submitted to the Fire Marshal for review and approval in compliance with the spirit and intent of this Conceptual Fire Protection Plan

*Fire Protection Plan; Otay Ranch Villages 2, 3 and a portion of 4
Hunt Research Corporation*

APPENDIX:

- A Prohibited Plant List
- B Photos of site
- C BEHAVE fire spread models
- D Recommendations for Brush Management and decks on Private Lots
- E Village 2 and 4 Brush Management Zones Exhibit

**APPENDIX A
 Prohibited Plant List**

Trees

Botanical Name	Common Name	Resource
Abies species	Fir Trees	S
Acacia species	Acacia	HS
Agonis juniperina	Juniper Myrtle	S
Araucaria species	Norfolk Island Pine	S
Callistemon species	Bottlebrush	H
Cedrus species	Cedar	HS
Chamaecyparis species	False Cypress	S
Cinnamomum camphora	Camphor Tree	H
Conifers		H
Cryptomeria japonica	Japanese Cryptomeria	S
Cupressocyparis leylandii	Leylandii Cypress	S
Cupressus forbesii	Tecate Cypress	S
Cupressus glabra	Arizona Cypress	S
Cupressus sempervirens	Italian Cypress	S
Cupressus species	Cypress	H
Eucalyptus species	Eucalyptus	HS
Eucalyptus	Eucalyptus Species	K
Juniperus species	Juniper	H
Larix species	Larch	S
Olea europea	Olive Tree	H
Palmae species	Palms	HS
Parkinsonia aculeata	Mexican Palo Verde	K
Pinus species	Pine	HS
Pittosporum undulatum	Victorian Box	K
Podocarpus species	Fern Pine	S
Prunus caroliniana	Carolina Cherry Laurel	K
Prunus lyonil	Catalina Cherry	K
Pseudotsuga menziesii	Douglas Fir	S
Quercus engelmannii	Engelmann Oak	K
Quercus suber	Cork Oak	K
Schinus molle	California Pepper Tree	H
Tamarix species	Tamarix	C
Taxodium species	Cypress	S
Taxus species	Yew	S
Tsuga species	Hemlock	S
Washingtonia filifera	California Fan Palm	H

Groundcovers, Shrubs & Vines

Botanical Name	Common Name	Resource
Acacia species	Acacia	HS
Achillia millefolium	Common Yarrow	K
Adenostoma fasciculatum	Chamise	HS
Adenostoma sparsifolium	Red Shanks	HS
Aeonium decorum	Aeonium	K
Aeonium simsii	ncn	K
Ajuga reptans	Carpet Bugle	K
Anthemix cotula	Mayweed	H
Aptenia cordifolia x 'Red Apple'	Red Apple	K
Arbutus menziesii	Madrone	H
Arctostaphylos species	Manzanita	H
Artemisia pycnocephala	Beach Sagewort	K
Artemisia californica	California Sagebush	HS
Artemisia caucasica	Caucasica Artemisia	H
Artemisia pycnocephala	Sandhill Sage	H
Artemisia species		H
Arundo donax	Giant Cane	C
Atriplex species	Saltbush	H
Atriplex canescens	Four-Wing Saltbush	K
Atriplex lentiformis ssp. Breweri	Brewer Saltbush	K
Baccharis pilularis consanguinea	Chapparral Bloom	H
Baccharis pilularis var. pilularis	Twin Peaks	K
Baccharis species	Coyote Bush	H
Bambusa species	Bamboo	S
Bougainvillea species	Bougainvillea	H
Brassica nigra	Black Mustard	H
Brassica rapa	Yellow Mustard	H
Cardaria draba	Hoary Cress, Perennial Peppergrass	H
Carpobrotus species	Ice Plant, Hottentot Fig	H
Carpobrotus chilensis	Sea Fig Ice Plant	K
Chrysanthemum leucanthemum	Oxeye Daisy	K
Cirsium vulgare	Wild Artichoke	H
Conyza canadensis	Horseweed	H
Coprosma pumila	Prostrate Coprosma	S
Cortaderia selloana	Pampas Grass	HC
Crassula Lactea	ncn	K
Crassula multicava	ncn	K
Crassula ovata	Jade Tree	K
Crassula tetragona	ncn	K
Cytisus Spp.	Scotch Broom, French Broom, etc.	HC
Delosperma 'alba'	White Trailing Ice Plant	K

*Fire Protection Plan; Otay Ranch Villages 2, 3 and a portion of 4
 Hunt Research Corporation*

Dodonea viscosa	Hopseed Bush	S
Drosanthemum floribundum	Rosea Ice Plant	K
Drosanthemum hispidum	ncn	K
Drosanthemum speciosum	Dewflower	K
Eriogonum fasciculatum	Common Buckwheat	H
Eriogonum species	Common Buckwheat	HS
Eschscholzia Mexicana	Mexican Poppy	K
Fremontodendron species	Flannel Bush	H
Gaillardia x grandiflora	Blanketflower	K
Gazania hybrids	South African Daisy	K
Gaxania rigens leucolaena	Trailing Gazaniz	K
Hedera helix	English Ivy	H
Helix canariensis	English Ivy	K
Heterotheca grandiflora	Telegraph Plant	HS
Hypericum calycinum	Aaron's Beard	K
Juniperus species	Juniper	S
Lactuca serriola	Prickly Lettuce	H
Lampranthus aurantiacus	Bush Ice Plant	K
Lampranthus filicaulis	Redondo Creeper	K
Lampranthus spectabilis	Trailing Ice Plant	K
Limonium pectinatum	ncn	K
Limonium perezii	Sea Lavendar	K
Lonicera japonica	Japanese Honeysuckle	S
Lonicera japonica 'Halliana'	Hall's Japanese Honeysuckle	K
Lotus coniculatus	Bird's Foot Trefoil	K
Mahonia species	Mahonia	H
Malephora luteola	Trailing Ice Plant	K
Miscanthus species	Eulalie Grass	S
Muehlenbergia species	Deer Grass	S
Nerium oleander	Oleander	K
Nicotania bigelovii	Indian Tobacco	H
Nicotania glauca	Tree Tobacco	H
Ophiopogon japonicus	Mondo Grass	K
Osteospermum fruticosum	Trailing African Daisy	K
Penstemon spectabilis	Beard Tongue	K
Pennisetum setaceum	Fountain Grass	C
Perronskia Atripliciflora	Russian Sage	H
Pickeringia 'Montana'	Chaparral Pea	S
Plantago sempervirens	Evergreen Plantain	K
Portulacaria afra	Elephant's Food	K
Potentilla tabernaemontanii	Spring Cinquefoil	K
Rhamnus Alaternus	Italian Buckhorn	K
Rhus Diversiloba	Poison Oak (worker/firefighter safety)	H
Rhus laurina	Laurel Sumac	H
Rhus Lentii	Pink Flowering Sumac	H

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Ricinus communis	Castor Bean	H
Romneya coulteri ‘white cloud’	White Cloud Matilija Poppy	K
Rosmarinus species ¹	Rosemary	S
Salsola austrails	Russian Thistle	H
Salvia mellifera	Black Sage	S
Salvia species	Sage	H
Sedum acre	Goldmoss Sedum	K
Sedum album	Green Stonecrop	K
Sedum confusum	ncn	K
Sedum ilineare	ncn	K
Sedum x rubrotinctum	Pork and Beans	K
Senecio serpens	ncn	K
Solanum xantii	Purple Nightshade (toxic)	H
Silybum marianum	Milk Thistle	H
Tamarix Spp.	Tamarisk	K
Tecomaria capensis	Cape Honeysuckle	K
Thuja species	Arborvitae	S
Trifolium hirtum ‘Hyron’	Hyron Rose Clover	K
Trifolium fragiferum ‘O’Connor’s’	O’Connor’s Legume	K
Urtica urens	Burning Nettle	S
Verbena species	Verbena	K
Vinca major	Periwinkle	H
Vinca minor	Dwarf Periwinkle	K
Vulpia myuros ‘Zorro’	Zorro Annual Fescut	K
Yucca species	Yucca	K

Exceptions

1. The use of palm trees is prohibited within any Brush Management Zones, however Palm trees may be permitted within the development (in moderation), with prior approval from the City of Chula Vista Fire Department. Proper spacing, irrigation and maintenance required.
2. Bougainvillea species may be used within the FPPA “B” Brush Management Zones, (in very moderate amounts), with prior approval from the City of Chula Vista Fire Department.

¹ Rosemariuns species (dwarf) is acceptable for use within this project area.

Notes

1. Various documents are referenced as sources for plant material information in this list of prohibited plant material. The titles of some of those reference documents suggest that some of the plant materials may be somewhat “Fire Retardant.” It must be understood that under various fire conditions, all plant materials will burn. Accordingly, some seemingly “Fire Retardant” plants appear in this Prohibited Plant List.
2. Some plants included in the Prohibited Plant List are documented elsewhere in publications as “Fire Resistant.” Others are documented as “High Fire Risk.” Notwithstanding any other descriptors, the preparers of this document have determined that plants in this Prohibited Plant List shall not be used within the Brush Management Zones within this project.
3. All vegetation used in Brush Management Zones and elsewhere in this development shall be subject to approval of the Fire Marshal. For those areas adjacent to the Chula Vista MSCP Preserve, specifically Wolf Canyon, all vegetation used in Brush Management Zones shall also be subject to the approval of the Director of Planning and Building.

Sources

- C** **City of Chula Vista**
Fire Retardant and/or Drought Tolerant Plant List
Landscape Manual, November 1994
- H** **Hunt Research Corporation Report**
Otay Ranch, Village 7 - Fire Protection Plan
Dated: June 14, 2005
- S** **County of San Diego**
Suggested Plant List for Defensible Space
<http://www.sdcounty.ca.gov/dplu/dos/UndesirablePlants.pdf>
- K** **Appendix K, City of Chula Vista MSCP Subarea Plan: San Diego County**
Fire Chief’s Association Fuel Modification Zone Plant List
Dated: July 15, 1997

Any deviations from the Prohibited Plant List must be submitted to the Fire Marshal for approval.

APPENDIX B - Site Photos

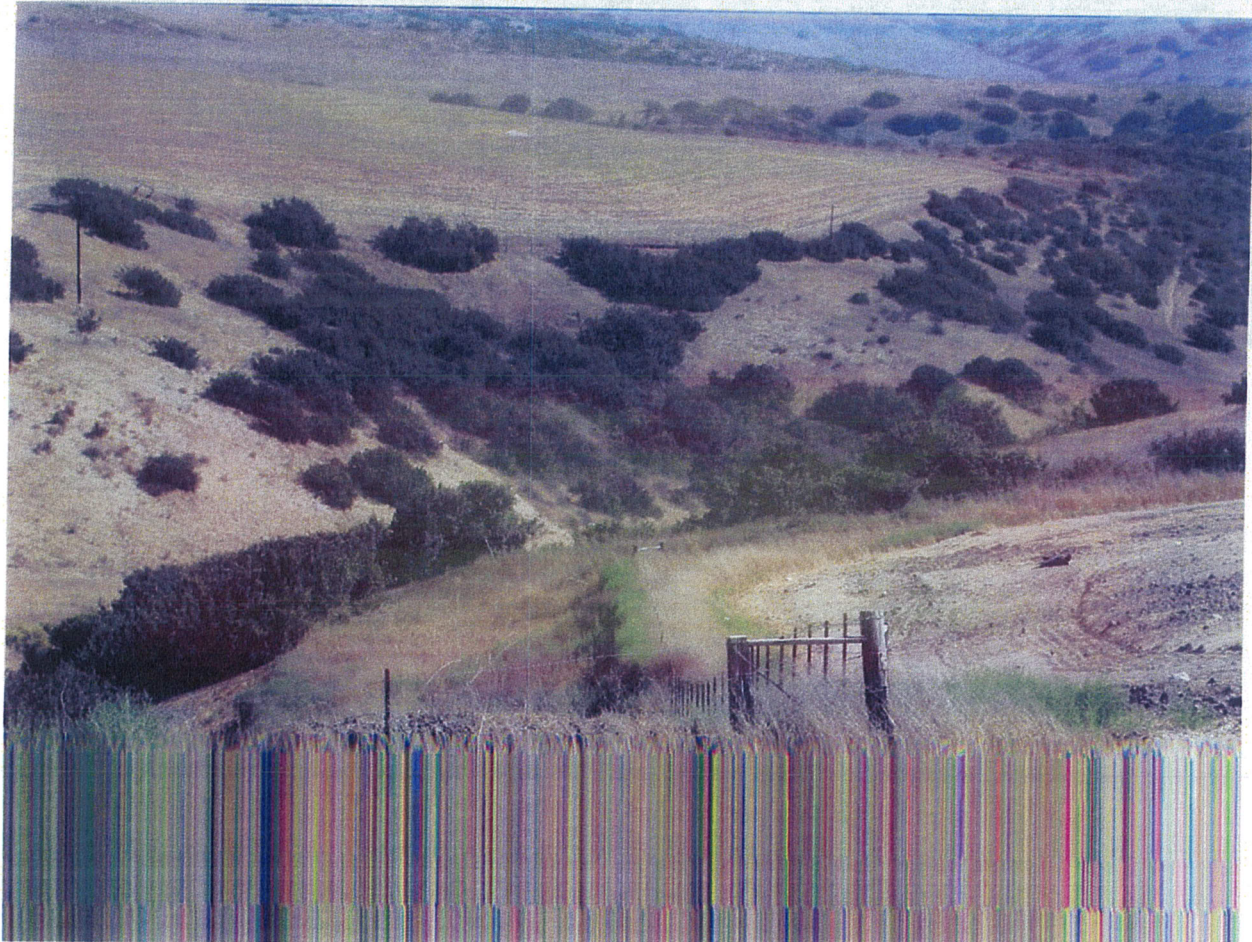
8-9-05 Draft Conceptual Fire Protection Plan; Otay Ranch Villages 2 and 3, by Hunt Research Corporation

Top photo: Wolf Canyon as viewed from Village 7
Bottom photo: Road running through Wolf Canyon



8-9-05 Draft Conceptual Fire Protection Plan; Otay Ranch Villages 2 and 3, by Hunt Research Corporation

Top and bottom photos: vegetation on sides of Wolf Canyon



*Fire Protection Plan; Otay Ranch Villages 2, 3 and a portion of 4
Hunt Research Corporation*

Vegetation on the side of Wolf Canyon



Appendix D

RECOMMENDATIONS FOR BRUSH MANAGEMENT AND DECKS ON PRIVATE LOTS

1. Planting, Spacing, Brush Management, Maintenance and Deck Guidelines

General information:

- A. Make all measurements on the horizontal straight out from structures, rather than down the slope.
- B. Maintenance includes irrigation and annual removal of weeds, dead materials, and other undesirable flammable vegetation required to keep the area fire safe.
- C. As new plantings mature, they must be thinned to maintain the recommended spacing and heights.
- D. The terms “fire resistant” or “fire retardant” are misleading. All vegetation and plants will burn if exposed to enough heat. Because something is considered fire retardant or fire resistant does not mean that unlimited quantities can be planted or that they will somehow slow down a fire.
- E. Limit or eliminate use of plants, which are known to be specifically flammable. (anything can burn given enough heat). Use low fuel volume, low profile, high leaf moisture, drought tolerant, fire resistive, ground cover, shrubs or lawn.
- F. Limit use of plants, which develop large amounts of foliage, branches, or dead material.
- G. Limit use of plants, which develop deciduous or shaggy bark.
- H. Limit use of plants, which develop dry or dead undergrowth.
- I. Recommended tree spacing is a minimum of 30’ between mature canopies for trees, if area is irrigated. More spacing needed if not irrigated.
- J. Shrubs and plants should have adequate spacing between mature plants and between mature shrubs to prevent fire spread. For example, 2 X height for slopes under 20%, 4 times height for slopes 21 to 40%, and 6 X height for slopes over 40%
- K. Keep shrubs 20’ from drip line of trees.
- L. Configure plantings so that they are spaced and maintained so as not to create a direct path from native growth to a structure.
- M. Do not use bark or chipped biomass in within 30’ of structure, unless material kept wet.
- N. All plant species must be limited to those approved by the Fire Department for this area. Don’t plant any vegetation listed on the Prohibited Plant List (Appendix A) in this plan.
- O. Prohibit massing of vegetation adjacent to structures, especially under eaves, overhangs, windows, vents, decks, etc.
- P. Yearly maintenance, before fire season (typically May 1, including during construction), and more often as needed, is required to reduce fuel volumes,

eliminate weeds, remove dead vegetation, cut grass, limb up and prune trees and shrubs, remove down and dead fuels, remove flammable under story, etc.

- Q. Maintenance is also required after any storms or high winds to remove down and dead vegetation and combustible debris from properties and zones.
- R. Caution must be used so as to not cause erosion or ground (including slope) instability, or excessive water runoff, due to landscaping, vegetation removal, vegetation management, maintenance, or irrigation.

2. Recommendations for Perimeter Private Homeowners Lots at Wolf Canyon Perimeter (also recommended for all private lots)

The following are recommendations of the Fire Protection Consultant to homeowners for Brush Management on their private lots, for purposes of fire safety. Recommendations are also provided for construction of decks on perimeter lots adjacent to perimeter Brush Management Zones. These are not required by the Fire Department. The developer will provide a “Homeowners Guide” to homeowners regarding fire safe planting in yards.

Zone A on private lot: Irrigated wet zone (0-30’ or entire internal lot if less than 30’): Every structure should have a 30’ “defensible space” surrounding it if 30’ is available on the private lot. The objective is to prevent flames from contacting glazing, walls, and vents and to keep fire from spreading from plant to plant. The following recommendation should be implemented:

- There should be no ground cover over 18” up against house.
- Shrubs should be limited to 24” high elsewhere. Dry grass should be limited to 3”.
- No flammable ornamental vegetation which can easily ignite and spread fire to structure.
- No vegetation under vents.
- No dry grass.
- No tree limbs, branches or vines within 10’ of chimneys or roofs.
- Fire resistive, drought adaptive, low fuel volume, low profile, high leaf moisture, low dead to live fuel ratio, bedding plants, flowers or shrubs of 24” or less (18” where up against house) may be allowed if properly maintained and if spaced a distance between mature plants and between mature shrubs. For example, 2 times (2X) the height of the mature plant for slopes less than 20%. Shrubs should be kept out from drip line of from trees
- No red shank, chamise (adenostema), sage (salvia spp), coastal sage scrub, sagebrush, California buckwheat (erigonum fasciculatum), manzanita (artostaphylos). Refer to Prohibited Plant List (Appendix A) of this plan.
- No flammable exotics, no cypress, juniper, acacia, eucalyptus, conifer (such as pine, cedar) palm, camphor, bottlebrush or pampas grass on any private lots. No pepper or olive trees on private lots. (and no vegetation from the Prohibited Plant List (Appendix A) of this plan).

- Single, approved, tree specimens, widely spaced, may be installed beyond 15' from structure if properly limbed (1/3 height of mature trees or 8'), pruned, maintained and configured with no dead fuel component.
- Trees should have 30' between mature canopies. The City requires each house to have a tree in front in the parkway. Such trees will be spaced and maintained to City standards.
- No plants or trees from the Prohibited Plant List (Appendix A) of this plan should be planted or remain in this zone.
- No bougainvillea unless properly maintained and spaced away from structures.
- No firewood, lumber, fuel or propane tanks within 30' of any structure. Small barbeque tank is allowed.

Zone B: Irrigated Low Fuel volume zone": (31' to 100' on private lot, or to edge of private lot if less than 100')

- Ground cover, bedding plants, shrubs and flowers to be fire resistive, drought adaptive, low profile (not over 2'), low fuel volume, high leaf moisture.
- No red shank, chamise (adenostema), sage (salvia spp), coastal sage scrub, sagebrush, California buckwheat (erigonum fasciculatum), manzanita (artostaphylos).
- No plants shall be used listed Prohibited plant List (Appendix A) of this plan.
- No flammable exotics, no cypress, juniper, acacia, eucalyptus, conifer (such as pine, cedar) palm, camphor, bottlebrush or pampas grass on any private lots. No pepper or olive trees on private lots. Dry grass to be less than over 3".
- Irrigated grass may be over 3" high.
- Spacing of all plantings between mature plants and between mature shrubs to be the same as for Zone A of private lot.
- Limb up trees 1/3 height of mature trees or 8'.
- Trees shall be spaced 30' between mature canopies.
- Shrubs should be outside of drip line under trees.
- Break up continuous fuel beds.
- Separate, limb up, and prune all vegetation.
- Remove all down and dead fuels.
- Break up any contact between ground fuels and aerial (tree) fuels.
- Properly sized chipped biomass (1/4" to 1/2" diameter by 4" to 6" long by 4" deep, with no manure added) may be installed and maintained in landscaped areas 30' and beyond from any structure. The objective is to convert the vegetation to a Fuel Model 8 (slow burning, low heat release fire) and to preclude exotic grasses from regenerating. Any mulch on private lots must be kept wet.
- No vegetation from the Prohibited Plant List (Appendix A) of this plan

Note: Decks, balconies, carports patio covers, gazebos, similar architectural appendages, unenclosed floors and roofs, and any projections from structures, on perimeter lots facing the Village 2 Wolf Canyon threat should be approved non combustible, one hour fire rated or heavy timber. The underside should be

enclosed on all sides. When such appendages are attached to exterior walls, they should be constructed to maintain the fire resistive integrity of the wall. There should be no plastic or composite decks or railings, which can melt in fire conditions or contribute to fire spread. Decks, gazebos, patios, and other ancilliary structures, should not overhang any slopes.

APPENDIX E:

BRUSH MANAGEMENT ZONES

SECTIONS

- ① Fire Protection Planning Area "A" - Wolf Canyon, Preserve Boundary Condition 1 - Village 2
- ② Fire Protection Planning Area "A" - Wolf Canyon, Preserve Boundary Condition 2 - Village 2
- ③ Fire Protection Planning Area "A" - Wolf Canyon, Preserve Boundary Condition 3 - Village 2
- ④ Fire Protection Planning Area "A" - Wolf Canyon, Preserve Boundary Condition 1 - Village 4 Community Park
- ⑤ Fire Protection Planning Area "A" - Wolf Canyon, Preserve Boundary Condition 2 - Village 4 Community Park
- ⑥ Fire Protection Planning Area "B" - Olympic Parkway
- ⑦ Fire Protection Planning Area "B" - La Media Road
- ⑧ Fire Protection Planning Area "A" - Wolf Canyon, Preserve Boundary Condition 2 - Village 3 Industrial Park

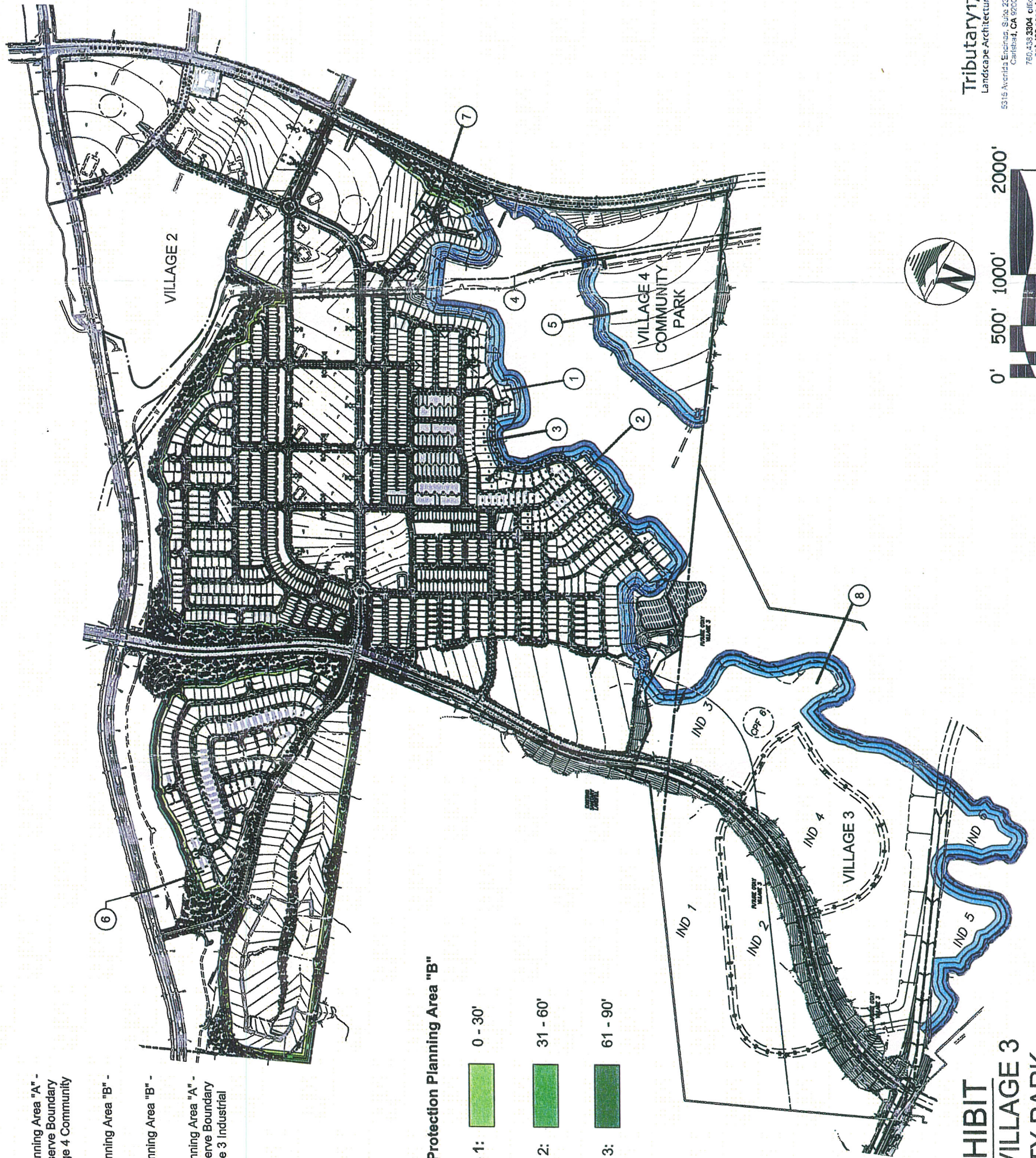
FIRE PROTECTION ZONES

Fire Protection Planning Area "A"

- Zone 1: 0 - 50'
- Zone 2: 51 - 100'
- Zone 3: 100 - 150'

Fire Protection Planning Area "B"

- Zone 1: 0 - 30'
- Zone 2: 31 - 60'
- Zone 3: 61 - 90'



FIRE PROTECTION EXHIBIT
OTAY RANCH VILLAGE 2, VILLAGE 3
AND VILLAGE 4 COMMUNITY PARK



28 FEB. '06

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