Appendix J –
Fire Protection and Emergency Evacuation Plan
Prepared by Dudek, June 2013

ESPERANZA HILLS
FIRE PROTECTION AND EMERGENCY EVACUATION PLAN
Orange County, California

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1.0 INTRODUCTION

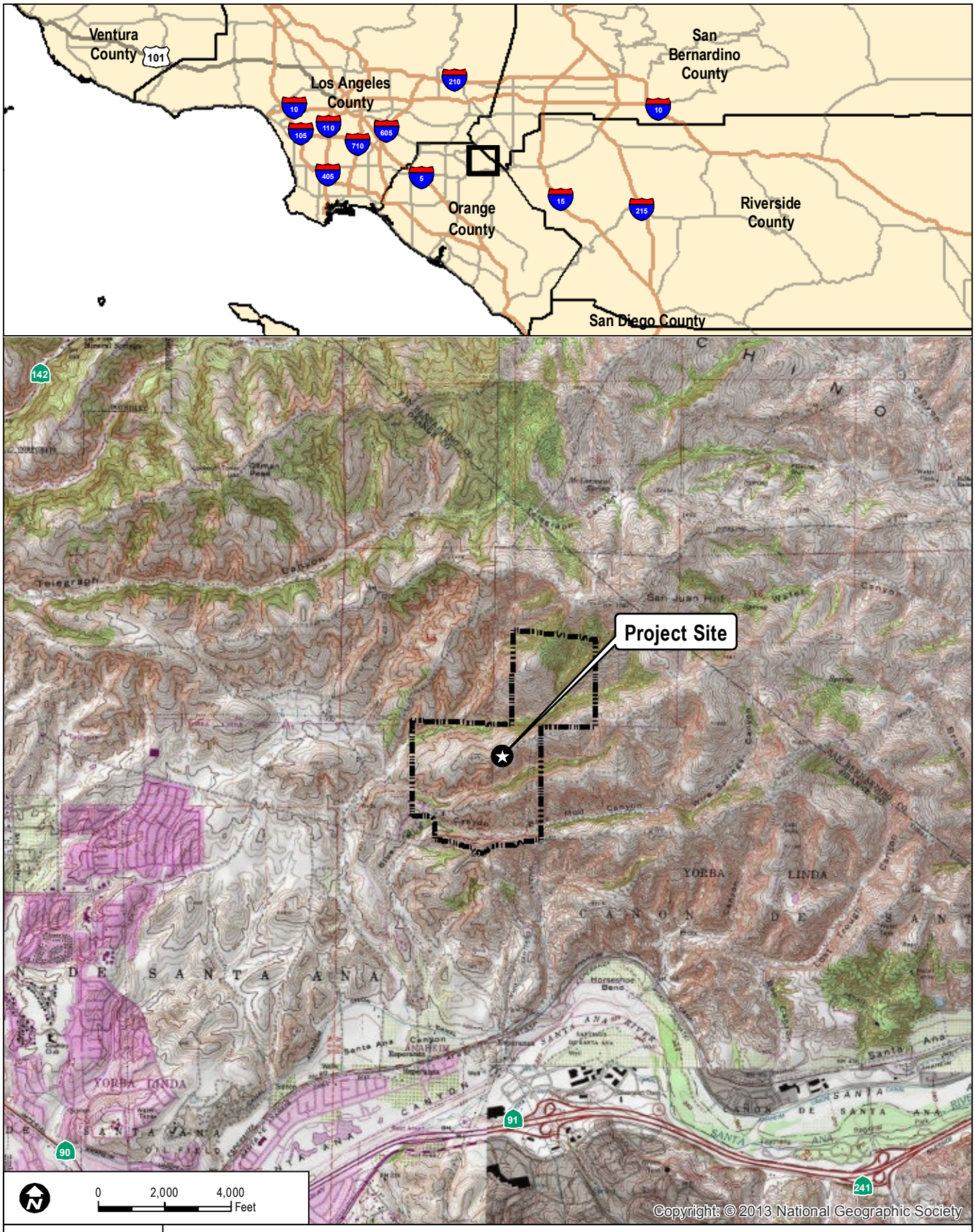
This Fire Protection and Evacuation Plan (FPEP) has been prepared for the Esperanza Hills Project (Project) in Orange County within the Yorba Linda sphere of influence. This FPEP evaluates and identifies the potential fire risk associated with the proposed project's residential land uses and identifies requirements for water supply, fuel modification and defensible space, emergency access, building ignition and fire resistance, fire protection systems, and wildfire emergency pre-planning and evacuation, among other pertinent criteria for fire protection. The purpose of this plan is to generate and memorialize the fire safety requirements of the Orange County Fire Authority (OCFA) along with project-specific measures based on the site, its intended use, and its fire environment. Although not a required project submittal in Orange County, this document has been prepared as a proactive measure analyzing the site's fire environment and its potential impact on the proposed community as well as the proposed community's potential impact on existing residents with regard to fire protection for incorporation into the project's Environmental Impact Report. Requirements and recommendations are based on site-specific characteristics and incorporate input from OCFA, area fire planning documents, site risk analysis, and standard principles of fire protection planning. This FPEP is consistent with the concepts, results, and goals of the Orange County General Plan (Safety Element) and OCFA pre-planning for wildland fire, as well as Orange County Sheriff's Department, Emergency management planning and wildfire preparedness planning documents (2013). The recommendations and conditions provided herein are also consistent with the lessons learned from the 2008 OCFA Freeway Complex Fire After Action Report. Implementation of this FPEP is expected to result in lower fire hazard risk than currently exists at the undeveloped Esperanza Hills site and will provide fire risk reduction benefits for existing communities to the south and west.

1.1 Esperanza Hills – Fire Protection and Emergency Evacuation Plan Summary

The Esperanza Hills project is located in the southwestern portion of the Chino Hills (Figure 1). The project site encompasses nearly 469 acres south and west of Chino Hills State Park, north of the 91 corridor, and within the Yorba Linda sphere of influence. The site currently includes steep terrain, wildland fuels, and a landscape that is vulnerable to periodic wildfire, as most recently experienced during the 2008 Freeway Complex Fire, which burned most of the Chino Hills, including the entire Esperanza Hills site. The Freeway Complex Fire, after merging with a second fire, burned into portions of several cities, including Anaheim, Brea, Corona, and Yorba Linda. A total of 381 structures (residences and other buildings) were lost in the fire. Following similar findings of large fire events over the last decade, the Orange County Fire Authority concluded in their After Action Report (OCFA 2008) that homes lost were primarily those that were of older,

more vulnerable construction methods and materials and primarily from embers that penetrated into attic spaces. Conversely, newer homes performed well due to the ignition resistant construction standards that were formally adopted in Yorba Linda in 1996, and have been increasingly more restrictive and ignition resistant in the code updates occurring in 2001, 2003, 2007 and currently in the 2010 codes. It is important to note that the ignition resistant construction standards, along with requirements for water supply, fire apparatus access, fuel modification and defensible space, interior fire sprinklers (required as of the 2010 code update) and fast fire response times were integrated into the code requirements based on results of post-fire assessments, similar to the After Action Reports that are now required. When it became clear that specifics of how homes were built, how fire and embers ignited homes, what effects fuel modification had on structure ignition, how fast firefighters could respond, and how much water was available, etc., were critically important to structure survivability, the Fire and Building codes were revised appropriately. California now boasts one of most restrictive codes for building within WUI areas that focus on preventing structure ignition from heat, flame, and burning embers.

There are two primary concerns for structure ignition: 1) radiant and/or convective heat and 2) burning embers (NFPA 1144 2008, Ventura County Fire Protection District 2011, IBHS 2008, and others). Burning embers have been a focus of building code updates for at least the last decade, and new structures in the WUI built to these codes have proven to be very ignition resistant. Likewise, radiant and convective heat impacts on structures have been minimized through the Chapter 7A exterior fire ratings for walls, windows and doors. For example, San Diego County after fire assessments strongly indicate that the building codes are working in preventing home loss: of 15,000 structures within the 2003 Cedar fire perimeter, 17% (1,050) were damaged or destroyed. However, of the 400 structures built to the 2001 codes (the most recent at the time), only 4% (16) were damaged or destroyed. Further, of the 8,300 homes that were within the 2007 Witch Creek Fire perimeter, 17% were damaged or destroyed. A much smaller percentage (3%) of the 789 homes that were built to 2001 codes were impacted and an even smaller percentage (2%) of the 1,218 structures built to the 2004 Codes were impacted (IBHS 2008). Even more telling and applicable at the Esperanza Hills site, of the 194 structures that were lost or damaged in the Freeway Complex Fire (2008), there were no structures within the fire perimeter lost that were built to at least the 1996 special fire area codes enacted by the City of Yorba Linda (OCFA 2008). Those codes required structure hardening against wildfire, but are less restrictive and result in less ignition resistant structures than current codes. Structures built to the 2010 Fire and Building Codes result in highly ignition and ember resistant structures. When combined with maintained fuel modification areas, fire apparatus access, water (fire flow), and an equipped and trained responding fire agency, the result is a defensible community that also provides risk reduction to neighboring communities with older, more vulnerable structures, as detailed throughout this FPEP.



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SOURCE: USGS

FIGURE 1

Project Vicinity Map

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ESPERANZA HILLS FIRE PROTECTION AND EMERGENCY EVACUATION PLAN

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Similarly to building code successes, provisions for modified fuel areas separating wildland fuels from structures have reduced the number of fuel-related structure losses by providing separation between structures and wildland fuels. As such, most of the primary components of the layered fire protection system provided for the Esperanza Hills project are required by county and state codes, but are worth listing because they have been proven effective for minimizing structural vulnerability to wildfire and, with the inclusion of required interior fire sprinklers (required in the 2010 Building/Fire Code update), of extinguishing nearly 95% of interior fires, should embers succeed in entering a structure. Even though these measures are now required by the latest Building and Fire Codes, at one time, they were used as mitigation measures for buildings in WUI areas, because they were known to reduce structure vulnerability to wildfire. These measures performed so well, they were adopted into the code. The following project features are required for new development in WUI areas and form the basis of the system of protection necessary to minimize structural ignitions as well as providing adequate access by emergency responders:

- Application of Chapter 7A, ignition resistant building requirements
- Minimum 1-hour rated exterior walls and doors
- Multi- pane glazing with a minimum of one tempered pane
- Ember resistant vents (recommend BrandGuard, O'Hagin, or similar vents)
- Interior, automatic fire sprinklers exceeding code for occupancy type (Esperanza Hills will also include attic heads, above and beyond the existing requirement)
- Modern infrastructure, access roads, and water delivery system
- 170 feet of maintained fuel modification areas
- Fire apparatus access roads throughout the community

The developed portion of this property is proposed for improvements that include construction of a new residential community with residences and associated infrastructure and utilities. The entire site has been designed with fire protection as a key objective. As detailed in this FPEP, the project site's fire protection system will include a redundant layering of protection methods that have proven to reduce overall fire risk. The requirements and recommendations included herein are performance based and site specific rather than a prescriptive, one-size-fits-all approach. The fire protection system is designed to dramatically reduce the wildfire risk on the site and the neighboring area, to minimize risks associated with typical uses and to develop and implement a strategic evacuation plan for the community's residents during a wildfire event. No singular measure is intended to be relied upon for the site's fire protection, but rather, a system of fire protection measures, methods, and features combine to result in enhanced fire safety, reduced fire potential, and practiced evacuation protocols.

Early evacuation for any type of emergency situation at Esperanza Hills is the preferred method of providing for resident and neighboring community safety. As such, the community will formally adopt, practice, and implement a "Ready, Set, Go!" (International Fire Chiefs Association 2013) approach to site evacuation. Pre-planning for emergencies, including wildfire emergencies, focuses on being prepared, having a well-defined plan, minimizing potential for errors, maintaining the site's fire protection systems, and implementing a conservative (evacuate as early as possible) approach to evacuation and site uses during periods of fire weather extremes.

Additionally, the pre-planning efforts include a contingency plan should unforeseen circumstances interfere with the preferred option of early evacuation. This contingency plan considers the safety of Esperanza Hills residents as well as that of neighboring communities by enacting an alternative to off-site evacuation if it would hinder evacuation of older, more vulnerable communities and/or put Esperanza Hills residents at greater risk. This contingency plan would only be instituted if it were unsafe or not possible to move residents from the community to areas further from an encroaching wildfire via public road ways. This scenario could occur if roads are overloaded (it is more important to evacuate residents of older communities threatened by wildfire), congested by vehicle accidents, toppled trees or down power lines, or if spot fires ahead of a wind-driven fire ignite fuels, including off-site, older homes in WUI areas adjacent roadways. In the extremely rare circumstance where conditions would risk the safety of evacuating the Esperanza Hills Community, fire and law enforcement officials will have the option of directing a partial on-site community evacuation or a temporary on-site sheltering strategy.

This FPEP is intended to guide the design, construction, and maintenance of project-related improvements in compliance with applicable fire codes and to guide enhancements and the ongoing functionality of the Esperanza Hills' Community Evacuation Plan. When properly implemented and maintained, the requirements and recommendations detailed herein are designed to result in fire hazard risk reduction.

To that end, preparation of this FPEP reflects completion of the following tasks:

- On-site and vicinity fire risk assessment
- Fire behavior modeling
- Fire history analysis
- Fire behavior based evacuation trigger analysis
- Review of various project details/plans
- Review and incorporation of Orange County Fire Authority Building and Fire Codes
- Incorporation of project-specific recommendations.

1.2 Applicable Codes/Existing Regulations

This FPEP demonstrates that the Esperanza Hills' proposed project will be in compliance with applicable portions of the 2010 California Building and Fire Codes, Chapter 7A, 2010 California Fire Code, Chapter 49, and 2010 California Residential Code, Section 237 as adopted by the County of Orange. Chapter 7A of the California Building Code focuses primarily on preventing ember penetration into homes, a leading cause of structure loss from wildfires. Thus, it is an important component of the requirements of this FPEP given its wildland urban interface location. As described in this FPEP, the project will meet or exceed all applicable Code requirements except for fuel modification distance for three lots which will be provided alternative methods/materials to achieve the same practical effect as full fuel modification.

1.3 Project Summary

1.3.1 Location

The Esperanza Hills Project is located within an unincorporated area of Orange County, California. Specifically, the project site is situated north of SR-91 Freeway, southwest of Chino Hills State Park, and adjacent to existing residential development in the City of Yorba Linda. The project is east of San Antonio Drive and north of Stonehaven Drive. It is located within Sections 17 and 18 of Township 3 South, Range 8 West on the U.S. Geographical Survey 7.5-minute Yorba Linda (dated 1964 and photo-revised in 1981) and Prado Dam (dated 1967 and photo-revised in 1981) quadrangle maps. The site also includes un-sectioned portions of Township 3S, Range 8W. The property lies within an area statutorily designated a State Responsibility Area Very High Fire Hazard Severity Zone (VHFHSZ) by Orange County Fire Authority and CAL FIRE (OCFA 2012). The project is also within the Local Area Agency Formation Commission (LAFCO) designated Sphere of Influence for the City of Yorba Linda. The project site is presented in Figure 2.

1.3.2 Project Description

The Esperanza Hills Project proposes to construct single-family residential homes on 468.9 acres of a 635 acre site. The Project is being evaluated for three conceptual site plan options which primarily differ by their main entry into the Esperanza Hills community. Proposed development for Option 1 is 334 homes, whereas Options 2 and 2A would include 340 homes. At build-out, all development options would consist of a gated entrance with low to moderate density residential and estate lots. Project components include 13.9 acres of parklands and roughly 7 miles of trails, including pedestrian, bicycle, and equestrian trails with access points to permit non-vehicular access to the Chino Hills State Park and surrounding open space areas. The

Project will retain approximately 230.8 acres of open space, including 146.9 acres of undisturbed natural open space and 83.9 acres of landscaping as part of a fuel modification plan. As part of a private community, a Homeowner's Association will be established to manage and maintain streets, landscaping, parks, and community-wide, fuel modification zones.

Entry into the Esperanza Hills community will be through one of two options. Option 1 (Figure 3) would provide a primary connection from Stonehaven Drive, a residential connector road, south of the project site. The proposed Option 1 improved fire apparatus access road would align with an existing dirt road which has been historically used by oil well operators, OCFA, City of Yorba Linda Water District, Southern California Edison, Chino Hills State Park, and neighboring residents for vehicular and foot access into the project area. Option 2 (Figure 4) proposes a primary connection to the west of the project site via Aspen Way, which intersects with San Antonio Road, a residential connector street. Option 2A (Figure 5) proposes a primary connection road that would be constructed to directly interconnect to San Antonio Road, roughly 1,280 feet south of Aspen Way to the west of the project site.

The project proposes updating the General Plan Land Use designation from Open Space to Suburban Residential to accommodate the development. An Esperanza Hills Specific Plan has been prepared to regulate and guide development of the property. Specific requirements within this FPEP will be incorporated into the Specific Plan. A Vesting Tentative Tract Map (VTTM 17522) has been prepared for this project. Since the project is within the City's Sphere of Influence, it is anticipated that annexation to the City of Yorba Linda may occur at a future date.

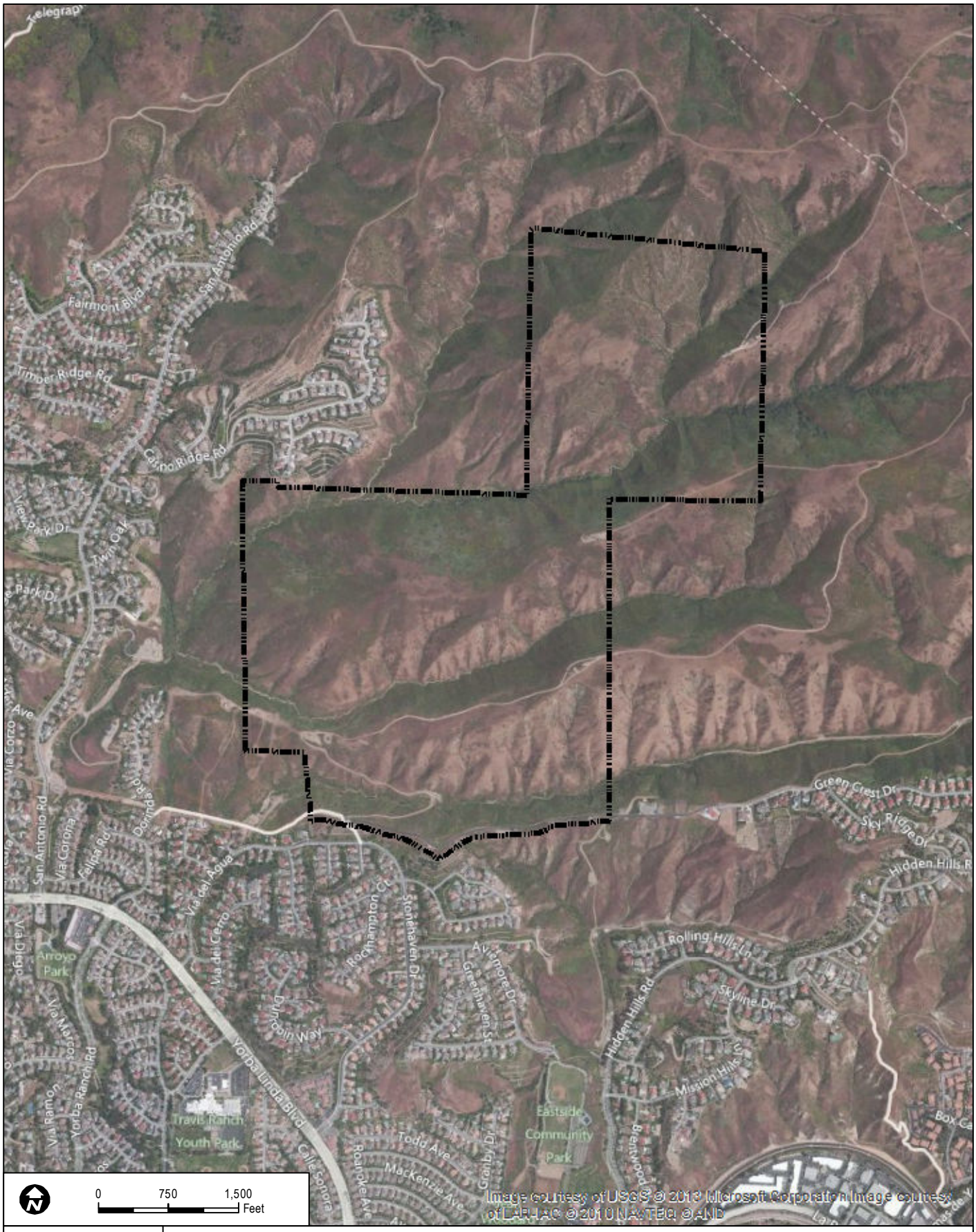

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FIGURE 2

Parcel Location Map

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FIGURE 3

Proposed Site Plan Improvements - Option 1

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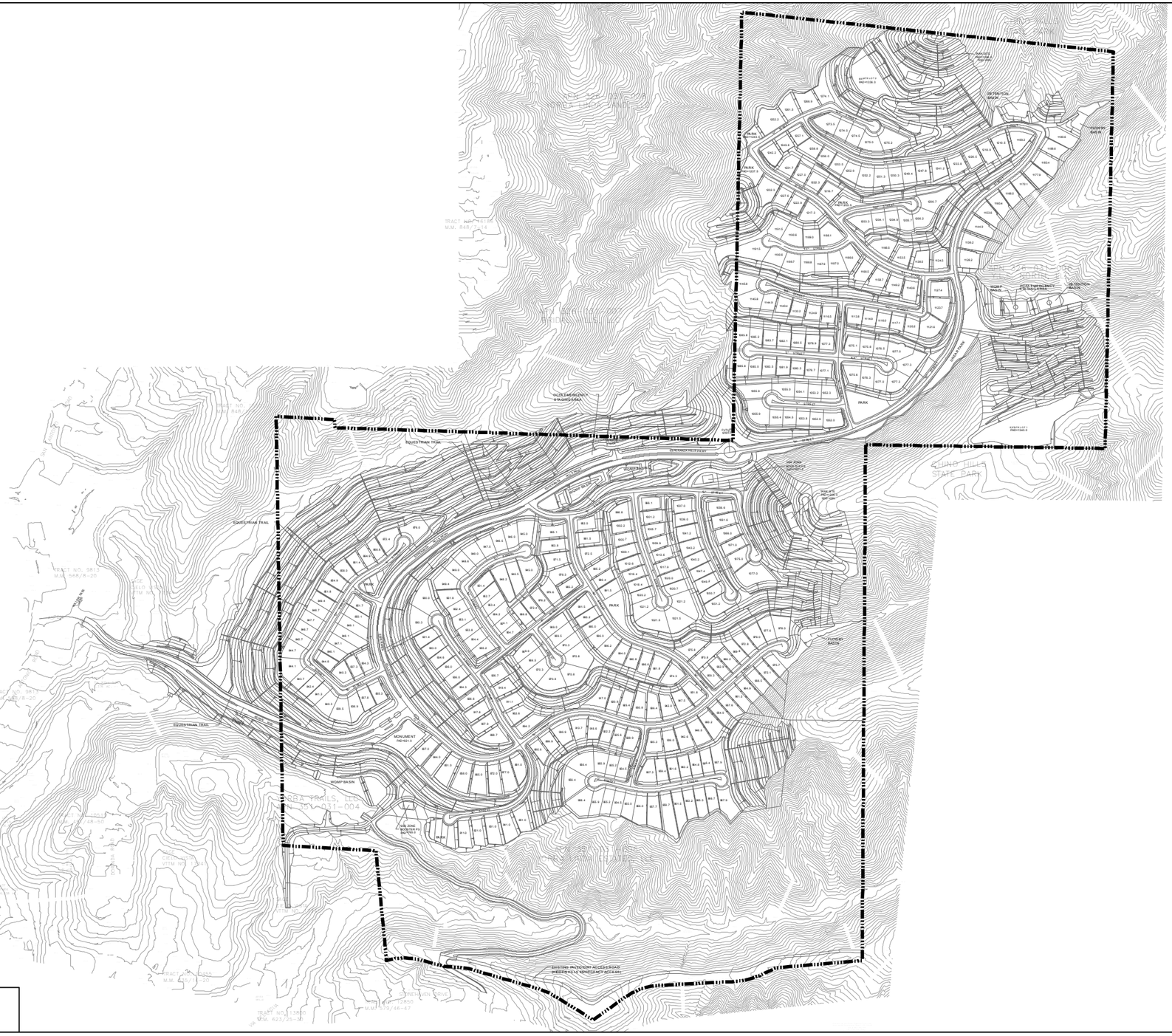

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FIGURE 4

Proposed Site Plan Improvements - Option 2

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FIGURE 5

Proposed Site Plan Improvements - Option 2A

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2.0 RISK ANALYSIS METHODS

2.1 Field Assessment

Dudek conducted a field assessment of the Project site on March 11, 2013, in order to document existing site conditions, to determine potential actions for addressing the protection of the project's structures, and for developing evacuation trigger points and evacuation contingency plans. While on site, Dudek assessed the area's topography, natural vegetation and fuel loading, surrounding land use and general susceptibility to wildfire. Among the field tasks that were completed are:

- Vegetation measurements and mapping refinements
- Fuel load analysis
- Topographic features documentation
- Photograph documentation
- Confirmation/Verification of hazard assumptions
- Access/egress documentation.

Site photographs were collected and fuel conditions were mapped using 200-scale aerial images. Field observations were utilized to augment existing digital site data in generating the fire behavior models and formulating the recommendations presented in this FPEP. Refer to Appendix A for site photographs of existing site conditions.

2.2 Topography

The Project site is within the Chino Hills, just north of the north end of the Santa Ana Mountains and is aligned east-west with the down-slope end of the site facing the flatlands of Santa Ana Canyon and the City of Yorba Linda. The project site includes a variety of terrain, including steep slopes, rolling hills and narrow v-shaped ravines. The topography of the Project area is dominated by three ridgelines. The largest ridgeline occupies the northern portion of the Project area and is bordered on the north by an unnamed drainage. The central portion of the Project area contains two east-west tending ridgelines: Old Edison Trail and Old Edison Spur Road. The topography on- and off-site is situated such that winds may be accelerated as they enter the rugged terrain from either on- or off-shore directions. Further, this area is subject to seasonal Santa Ana winds which are enhanced as they are funneled into the 91 corridor to the south of this site. Slopes on the site vary, ranging from moderate to steeply sloped, up to 55% along drainage walls in the steeper canyons. Esperanza Hills' site elevations range from approximately 610 feet above mean sea level (AMSL) in the extreme southwestern portion of the property near Blue Mud Canyon to approximately 1,540 feet AMSL in the northeastern portion of the property below San Juan Hill. The property slope trends north to south and east to west.

Topography affects wildfire movement and spread. Steep terrain typically results in faster fire spread due to pre-heating of uphill vegetation. Flat areas typically result in slower fire spread, absent of windy conditions. Topography may form unique conditions which result in concentrated winds or localized fire funneling, such as saddles, canyons, and chimneys (land formations that collect and funnel heated air upward along a slope). Similarly, terrain may slow the spread of fire. For example, fire generally moves slower downslope than upslope. Terrain may buffer or redirect winds away from some areas based on canyons or formations on the landscape. The occurrences of terrain features that may affect fire behavior on the Esperanza Hills site were analyzed and incorporated into the risk assessment and in development of customized fuel modification zones.

2.3 Existing/Vicinity Land Use

The Esperanza Hills property is currently undeveloped, with the exception of oil well operations in the western portion of the site. Although the property has been used historically for grazing, its major use today is as open space and for energy transmission associated with the Southern California Edison Company (SCE). Grading on the site consists of dirt roads and pads for oil extraction equipment and general access to the property as well as to the SCE transmission corridor. The site is used by neighboring community residents for recreational uses including hiking/walking.

The surrounding land uses are primarily comprised of residential development and open space. Chino Hills State Park borders the project on the north and east sides of the property. Existing residential communities within the City of Yorba Linda, including Dominguez Ranch, Green Hills, Casino Ridge, Travis Ranch, and Yorba Linda Hills, are located to the south and northwest. The Sage-CieloVista project, a proposed residential subdivision in the County of Orange, lies to the west and southwest. The Bridal Hills, LLC parcel and the Yorba Linda Land, LLC parcel are located west and northwest of Esperanza Hills property.

2.4 Vegetation

The Esperanza Hills property supports a variety of vegetation types. Most of the site's vegetation was burned in the 2008 Freeway Complex Fire and is in varying states of recovery. Vegetation in the northern portion of the property is dominated by sage scrub-chaparral ecotone and annual grasslands consisting predominately of black sage (*Salvia mellifera*), purple sage (*Salvia leucophylla*), and brome grass (*Bromus diandrus*). Disturbed and undisturbed coastal sage scrub communities, which are dominated by California sagebrush (*Artemesia californica*), black sage, and purple sage can be found between the grassland and ecotonal areas. The areas of coastal sage scrub form a mosaic with Mexican elderberry

(*Sambucus arbutofolia*), laurel sumac (*Malosma laurina*), and toyon-sumac chaparral (*Heteromeles arbutofolia, Rhus integrifolia, and Malosma laurina)*. In the southern portion of the property, toyon-sumac chaparral and annual grasslands are dominant plant communities. The remaining areas in the southern property contain a mosaic of fragmented communities composed of disturbed and undisturbed California coastal sage scrub, Mexican elderberry woodland, sage-scrub chaparral ecotone, and purple sage scrub. The site also includes disturbed habitats characterized as ruderal and developed areas. A total of 16 vegetation and land cover types were delineated on site by the project biologist (Glenn Lukos Associates 2013), which includes one non-fuel land cover type (graded areas). These vegetation and land cover types were verified by Dudek fire protection planners and assigned a fuel model for use during site fire behavior modeling. The vegetation and land cover types and their coverage totals are summarized in Table 1.

Table 1
On-Site Vegetation and Land Cover Types – Esperanza Hills

Vegetation Type	Acreage	Percent Coverage	Corresponding Fuel Model
Annual Grassland	129.97	27.7%	1
Blue Elderberry Woodland	28.08	6.0%	GS2
California Coastal Sage Scrub	26.36	5.6%	SCAL18
California Walnut Woodland	6.37	1.4%	GS2
California Walnut-Mulefat Scrub	2.70	0.6%	GS2
Coast Live Oak Forest	5.84	1.2%	9
Disturbed California Coastal Sage Scrub	10.07	2.1%	SCAL18
Mulefat Scrub	1.11	0.2%	GS2
Purple Sage Scrub	10.14	2.2%	SCAL18
Ruderal	11.36	2.4%	1
Sage Scrub-Chaparral Ecotone	88.86	18.9%	SH5
Sagebrush-Monkey Flower Scrub	1.21	0.3%	SCAL18
Southern Willow Scrub	0.16	0.0%	8
Sumac Savannah	27.63	5.9%	1
Toyon-Sumac Chaparral	110.97	23.7%	SH5
Land Cover Type			
Graded	8.10	1.7%	0
Total	**468.94**		**N/A**

As presented, the majority of the vegetation on the Project site is represented by annual grasses and chaparral dominated plant communities. In total, the various sage scrub vegetation types account for 136.7 acres (29.7%) of coverage on the site. 129.7 acres (27.7%) of the 468.9-acre property include non-native, annual grasslands. Second highest, Toyon-Sumac chaparral, accounts for 111.0 acres (23.7%). This plant community occurs throughout

the site on the more mesic, north-facing slopes. Non-fuel areas that will not burn (dirt roads and bare ground) occur on 10.14 acres of the site and are located primarily along ridgetops for access to oil extraction equipment and SCE transmission lines. The project's vegetation and land coverage is illustrated in Figure 6 and briefly described below.

Most of the on-site vegetation will be converted to low-flammability urban landscapes and fuel modification zones. Site-adjacent vegetation (off-site and adjacent the fuel modification zones) is important relative to wildfire as some vegetation, such as brush and grassland habitats are highly flammable while other vegetation, such as riparian communities or forest understory, are less flammable due to their higher plant moisture content, compact structure, and available shading from overstory tree canopies. The effect vegetation has on fire behavior is substantial and understanding vegetation dynamics is important for developing an effective fuel modification plan.

2.4.1 Site Vegetation Community and Land Cover Type Descriptions

2.4.1.1 Annual Grassland

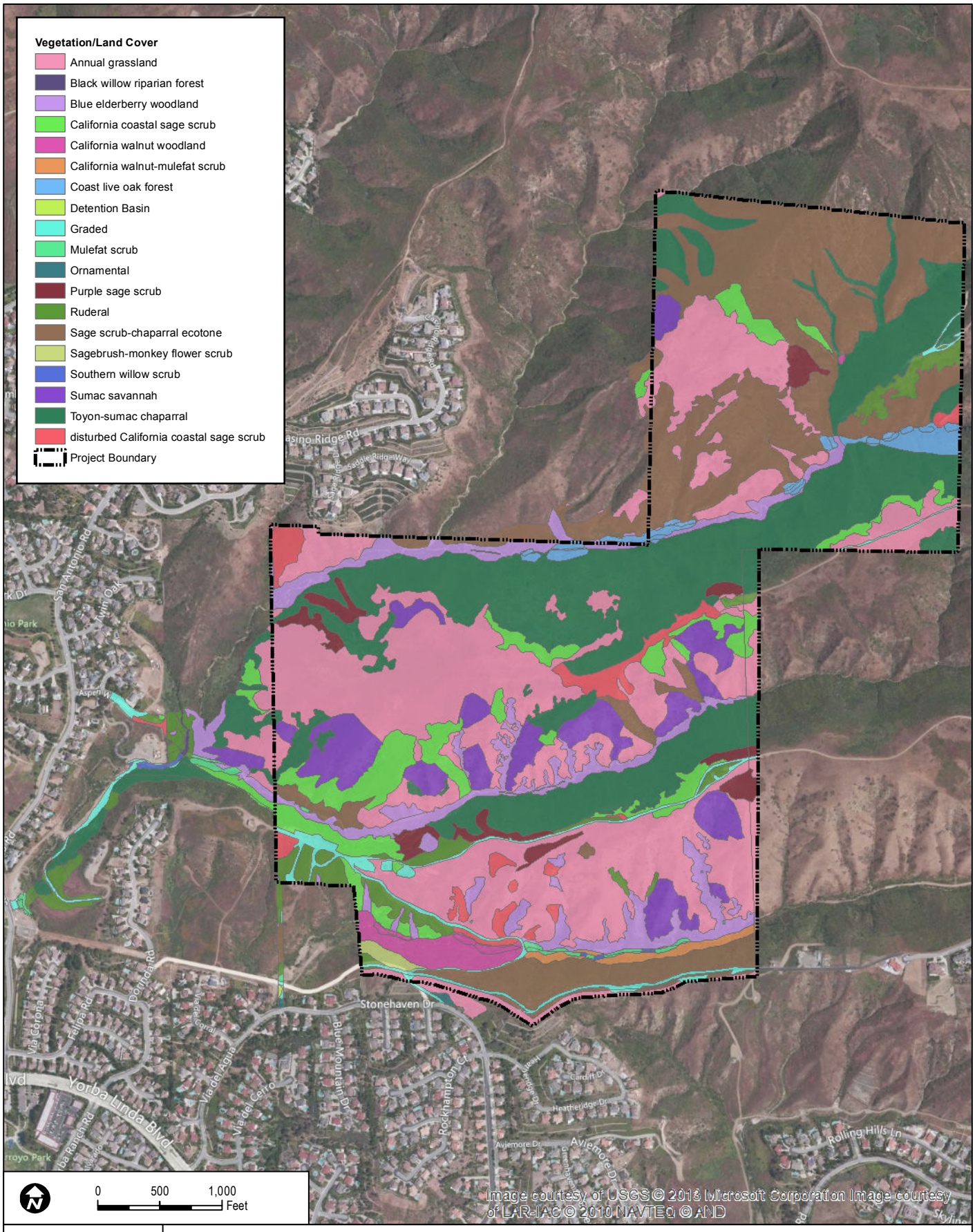
The annual grassland community is dominated by non-native grasses. Many of the non-native grasses found on site are considered to be a naturalized species in southern California. Dominant grasses include ripgut brome, soft chess, Italian wildrye, English wildrye, fox-tail grass, African fountain grass (*Pennisetum setaceum*), slender wild oats, and common wild oats. Dominant forbs mapped in the annual grassland community are Russian thistle, summer mustard, black mustard, tocalote, bur clover (*Medicago polymorpha*), horehound, and telegraph weed.

2.4.1.2 Black Willow Riparian Forest

The black willow riparian forest was mapped in the southeastern portion of the Study Area (prior to the Freeway Complex Fire) adjacent to residential housing and existing oil facilities. Some of the black willow riparian forest was associated with the streambed and was considered to be jurisdictional.

2.4.1.3 Blue Elderberry Woodland

Blue elderberry woodland was commonly observed on the lower slopes of hillsides and within the drier reaches of the riparian areas and on terraces adjacent to drainage courses.



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SOURCE: BING 2013; Glenn Lukos Associates 2013

FIGURE 6

Site Vegetation and Land Cover Map

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2.4.1.4 California Coastal Sage Scrub

The majority of the California coastal sage scrub was identified in the southeastern portion of the Study Area, however smaller areas of California coastal sage scrub were found throughout. The California coastal sage scrub on site was commonly observed adjacent to areas supporting non-native/native grasslands.

2.4.1.5 California Walnut Woodland

This community was observed in the southern portion of the Study Area and was closely associated with California sagebrush monkeyflower scrub, blue elderberry woodland, and the California sagebrush/chaparral ecotone. California walnut woodland was observed within the Study Area and occurs in one contiguous polygon in the southern portion of the Study Area; however, the majority of the trees were damaged and a few killed by the 2008 fire.

2.4.1.6 California Walnut-Mulefat Scrub

California walnut/mulefat scrub was mapped within Blue Mud Canyon in the southeastern portion of the Project Site and includes scattered walnut trees amongst mulefat understory.

2.4.1.7 Coast Live Oak Forest

Based on surveys in January of 2013, it is estimated that approximately 50% of the site's oak trees were killed by the fire with about 50% of the oaks exhibiting partial re-sprouting and otherwise in poor condition. Oak trees dominate this vegetation type with an understory of low growing ground cover.

2.4.1.8 Disturbed California Coastal Sage Scrub

The site's disturbed California coastal sage scrub is similar in composition to the California coastal sage scrub except that the diversity of native species is lower and the number of non-native species is higher. The disturbed California coastal sage scrub was found throughout the entire Study Area and was commonly observed adjacent to areas supporting non-native/native grasslands.

2.4.1.9 Mulefat Scrub

This plant community was observed in localized patches along drainages. This community was mapped in the southeastern portion of the Project Area and is commonly intermixed with the black willow riparian forest and blue elderberry woodland.

2.4.1.10 Purple Sage

The site's purple sage scrub was observed in the southern portion of the Project Site with the exception of one polygon in the northern portion. The purple sage scrub observed on site was commonly found adjacent to California coastal sage scrub, California coastal sage scrub/chaparral ecotone, and toyon/sumac chaparral.

2.4.1.11 Sage Scrub-Chaparral Ecotone

Two associations of ecotonal habitats were identified: California sagebrush/chaparral, and sumac savannah. Each of the ecotonal areas include characteristic species of the parent vegetation type.

2.4.1.12 Sagebrush-Monkey Flower Scrub

The site's sage-brush monkeyflower scrub was observed on north facing slopes within the southern portion of the Study Area in close proximity to the sagebrush/chaparral ecotone. This vegetation type includes a shrub layer with a strong monkey flower representation.

2.4.1.13 Southern Willow Scrub

This community was mapped in the eastern portion of Blue Mud Canyon and the southern portion of Drainage D. This vegetation type includes shrub and tree sized willows within drainages bottoms.

2.4.1.14 Sumac Savannah

The site's sumac savannah was commonly observed on south facing slopes within areas supporting non-native/native grasslands. Areas mapped as sumac savannah contain the same understory species as the non-native/native grasslands but have a scattered cover of laurel sumac.

2.4.1.15 Toyon-Sumac Chaparral

This community was commonly observed on the north facing slopes of the Study Area. Chaparral is a dense vegetation type (although on this site it is more open and sparse due to the 2008 fire) that can produce significant flame lengths and aggressive fire.

2.4.1.16 Ornamental

One small area of ornamental vegetation was observed in the eastern portion of the Study Area adjacent to residential housing. Ornamental vegetation includes typical landscape ground covers and trees that are non-native and may be invasive.

2.4.1.17 Ruderal

This land cover type includes areas where the natural vegetation cover has been disturbed by humans, such as along graded roadsides. The majority of ruderal vegetation was mapped in the southern portion of the Study Area. A small area of ruderal vegetation was mapped in the northeast portion of the Project Site. This vegetation type was typically observed adjacent to the oil extraction equipment, roads and less commonly adjacent to riparian areas.

2.4.1.18 Disturbed

Disturbed areas include acreage where ground-disturbing activities have resulted in degraded habitats.

2.4.1.19 Graded/Detention Basin

The Study Area includes areas that have been previously graded, such as roads, pads, and a detention basin. The basin (located just off-site) consists of a constructed earthen detention basin vegetated with species including rabbitfoot grass (*Polypogon monspeliensis*), bristly ox-tongue (*Helminthotheca echiodes*), water beard grass (*Polypogon viridis*) and southern cattail (*Typha domingensis*). The basin is owned by Metropolitan Water District (MWD) and appears to be subject to regular maintenance.

2.4.2 Vegetation Dynamics

The vegetation characteristics described above and presented in Table 1 are used to model fire behavior, discussed in Section 3.0 of this FPEP. Variations in vegetative cover type and species composition have a direct effect on fire behavior. Some plant communities and their associated plant species have increased flammability based on plant physiology (resin content), biological function (flowering, retention of dead plant material), physical structure (bark thickness, leaf size, branching patterns), and overall fuel loading. For example, the native shrub species that compose the coastal sage scrub communities on site are considered to exhibit higher potential hazard (higher intensity heat and flame length) than grass dominated plant communities (fast moving, but lower intensity) based on such criteria. The corresponding fuel models for each of these vegetation types are designed to capture these differences. Additionally, vegetative cover influences fire suppression efforts through its effect on fire behavior. For example, while fires burning in grasslands may exhibit lower flame lengths and heat outputs than those burning in native shrub habitats, fire spread rates in grasslands are often much more rapid.

As described, vegetation plays a significant role in fire behavior, and is an important component to the fire behavior models discussed in this report. A critical factor to consider is the dynamic nature of vegetation communities. Fire presence and absence at varying cycles or regimes disrupts plant community succession, setting succession progress back to an earlier state, as was experienced on this site during the 2008 fire. In summary, high frequency fires tend to gradually convert shrublands to grasslands or maintain grasslands, while fire exclusion tends to convert grasslands to shrublands. In general, biomass and associated fuel loading will increase over time, assuming that disturbance (fire, grazing) or fuel reduction efforts are not diligently implemented. Succession is a natural process within plant communities. The fuel modification zones on this site will consist of manicured ornamental landscapes and highly managed plant communities that will be subject to regular "disturbance" in the form of maintenance and will not be allowed to accumulate biomass over time.

Wildfire disturbances can also have dramatic impacts on plants and plant composition. Heat shock, accumulation of post-fire charred wood, and change in photoperiods due to removal of shrub canopies may all stimulate seed germination (Keeley and Keeley 1984). The post-fire response for most species is vegetative reproduction and stimulation of flowering and fruiting follows. The combustion of aboveground biomass alters seedbeds and temporarily eliminates competition for moisture, nutrients, heat, and light (Wright and Heinselman 1973). Species that can rapidly take advantage of the available resources will flourish. It is possible to alter successional pathways for varying plant communities through manual alteration. This concept is a key component in the overall establishment and maintenance of the proposed fuel modification zones on site.

Conditions adjacent the site, where the wildfire threat will exist post-development, are classified as medium to heavy fuel loads due to the dominance of shrubs. Shrub cover, although less likely to burn in the first 20 years following establishment during typical weather conditions, will burn at any age under extreme fire events (Moritz 2003). Once established, shrub cover will increase in volume and, following approximately 20 years, the hazard will increase corresponding with fuel age (Keeley 2005), a condition that has been planned for in this FPEP. Changes in land-use will also affect the vegetation distribution pattern across Esperanza Hills with large areas being converted to lower flammability landscapes, such as irrigated, maintained landscapes and ignition resistant structures. This is a significant change for this site and mitigates roughly 70% of the native fuels that would otherwise remain on site. The remaining fuels will be managed as fuel modification that also provides habitat benefits for native wildlife species.

2.5 Climate

As with most of Southern California, the project area is influenced by the Pacific Ocean and is frequently under the influence of a seasonal, migratory subtropical high pressure cell known as the Pacific High. Wet winters and dry summers, with mild seasonal changes, characterize the Southern California climate. This climate pattern is occasionally interrupted by extreme periods of hot weather, winter storms, or dry, easterly Santa Ana winds (Western Regional Climate Center (WRCC) 2013a). The average high temperature for the site (near City of Yorba Linda) is approximately 77°F, with average highs in the summer and early fall months (July through October) reaching 88°F. The average precipitation for the area is approximately 14.4 inches per year, with the majority of rainfall concentrated in the months of January (2.99 inches), February (3.10 inches), and March (2.37 inches), while smaller amounts of rain are experienced during the other months of the year (WRCC 2013b).

The prevailing wind pattern is from the west, but the presence of the Pacific Ocean causes a diurnal wind pattern known as the land/sea breeze system. During the day, winds are typically from the west–southwest (sea), and at night, winds are from the northeast (land). During the summer season, the diurnal winds can be slightly stronger than the winds during the winter season due to greater pressure gradient forces. Surface winds can also be influenced locally by topography and slope variations. The varied topography on and around Esperanza Hills may affect wind velocity and patterns. The highest wind velocities are typically associated with downslope, canyon, and Santa Ana winds.

Typically the highest fire danger is produced by the high-pressure systems that occur in the Great Basin which result in the Santa Ana winds of Southern California. Sustained wind speeds recorded during recent major fires in Orange County exceeded 30 mph and may exceed 50 mph during extreme conditions. The Santa Ana wind conditions are a reversal of the prevailing southwesterly winds that usually occur on a region wide basis during late summer and early fall. Santa Ana winds are warm winds that flow from the higher desert elevations in the north through the mountain passes and canyons. As they converge through the canyons, their velocities increase. Consequently, peak velocities are highest at the mouths of canyons and dissipate as they spread across valley floors. This is especially noticeable through the 91 freeway corridor just south of the Esperanza Hills site where the Santa Ana River forms a steep sided “tunnel” through the Santa Ana Mountains. Winds commonly are accelerated through this corridor, which interfaces with open space areas to the south and east of Esperanza Hills. Santa Ana winds generally coincide with the regional drought period and the period of highest fire danger.

2.6 Fire History

Fire History data provides valuable information regarding fire spread, fire frequency, ignition sources, and vegetation/fuel mosaics across a given landscape. One important use for this information is as a tool for pre-planning. It is advantageous to know which areas may have burned recently and therefore may provide a tactical defense position, what type of fire burned on the site, and how a fire may spread. According to available data from the California Department of Forestry and Fire Protection (FRAP 2013), only two fires have burned within the Esperanza Hills property since the beginning of the historical fire data record[1]. These two fires (the 1980 Owl Fire and the 2008 Freeway Complex Fire) each burned the entirety of the property. This fire occurrence interval on site indicates that vegetation, terrain, and potentially suppression efforts have played a role in minimizing the role of fire on the Esperanza Hills property. Further analysis would need to be conducted to determine potential reasons why wildfires in the area have not historically moved into this property. However, given the higher occurrence of wildfires to the north in Carbon Canyon and slightly fewer in Telegraph Canyon and to the south along the south side of the 91 freeway, it is expected that roadway related ignitions (where they interface with wildland fuels) occurring during non-Red Flag Warning periods accounts for the ignitions. There are several barriers and non-fuels on the north side of the 91 that likely limit vegetation ignitions toward the project. This is consistent with historical fire records which indicate that roughly 90% of wildfires occur on non-Red Flag Warning days and account for about 10% of the acreage burned. The other 10% of the wildfire occurences coincide with Red Flag Warning days and account for 90% of the acreage burned.

Fire occurring in the general vicinity of Esperanza Hills are illustrated in (Appendix B), which indicates the strong association with wildland urban interface roadways. Seven fires have burned within 1 mile of the Esperanza Hills property over the historic fire data record, all of which exceeded 1,000 acres in total size. Within 2 miles of the Portola Center property, 12 fires have burned over the recorded fire history period. The OCFA may have data regarding smaller fires (less than 10 acres) that have occurred on the site that have not been included herein. Table 2 summarizes the fire history for the area surrounding the Esperanza Hills property.

[1] Based on polygon GIS data from CAL FIRE's Fire and Resource Assessment Program (FRAP), which includes data from CAL FIRE, USDA Forest Service Region 5, BLM, NPS, Contract Counties and other agencies. The data set is a comprehensive fire perimeter GIS layer for public and private lands throughout the state and covers fires 10 acres and greater between 1878 and 2012.

Table 2
Fire History within Two Miles of the Esperanza Hills Property

Fire Year*	Fire Name	Interval (years)	Total Area Burned (acres)
1948	Green River Fire	N/A	53,080
1959	La Vida Fire	11	610
1967	Paseo Grande Fire	8	51,076
1978	Soquel Fire	11	3,934
1980	Owl Fire	2	18,332
1982	Gypsum Fire	2	20,142
1985	Telegraph Fire	3	1,635
1985	Shell Fire	0	2,367
1990	Yorba Fire	5	7,883
2002	Blue Gum Fire	12	497
2005	Yorba Linda Fire	3	1,079
2008	Freeway Complex Fire	3	30,305

*FRAP 2013

Based on an analysis of this fire history data set, specifically the years in which the fires burned, the average interval between wildfires in the area was calculated to be 5.5 years with intervals ranging between 0 (multiple fires in the same year) and 12 years. Based on this analysis, it is expected that portions of the Chino Hills will be subject to wildfire at least every 5–6 years, with the realistic possibility of shorter interval occurrences, as observed in the fire history record. Further, the proximity of the Esperanza Hills property to large expanses of open space to the north and east in Chino Hills State Park and potential ignition sources along Highway 91, Highway 71, La Palma Avenue, Carbon Canyon Road and portions of Yorba Linda Boulevard contribute to increased wildfire hazard on the project site. The open space areas preserved within the Chino Hills State Park are not currently managed under an approved, directed fire management plan. Type conversion of native sage and chaparral communities will likely continue, converting to grasslands as the shrub layer is degraded from frequent fires. This will have the benefit of reducing the fire intensity associated with wildfires, but is not a preferred situation because grasses are more readily ignited and will result in more frequent fires. Additionally, the topography of Santa Ana River corridor to the south of the project has the potential to funnel Santa Ana winds as they pass through the narrow canyon section between Coal Canyon and Scully Hill, thereby increasing local wind speeds and increasing wildfire hazard in the region.

2.7 Fire Response

An important component of an FPEP is analysis of the existing fire department response capabilities, which allows a meaningful evaluation of the ability of those capabilities to meet the demands of a proposed project. Where capabilities are inadequate, mitigation measures are generated and provided in an FPEP or Alternative Materials and Methods report. As such, the response currently provided the Esperanza Hills site by OCFA is summarized in Table 3.

Table 3
Current Orange County Fire Authority Response Configuration nearby Esperanza Hills

Fire Station Number	Location	Estimated Travel time/miles to furthest point in project *		Total Response Time (assumes 1 minute dispatch and 1.3 minutes turnout)	
		Option 1	*Option 2***	*Option 1*	*Option 2***
10	18422 E. Lemon Drive Yorba Linda, California 92886	9.2 minutes/ 5.39 miles	7.9 minutes/ 4.6 miles	11.5 minutes	10.2 minutes
32	20990 Yorba Linda Blvd. Yorba Linda, California 92887	4.7 minutes/ 2.74 miles	4.1 minutes/ 2.4 miles	7.0 minutes	6.4 minutes
34	1530 N. Valencia Ave. Placentia, California 92870	13.4 minutes/ 7.82 miles	12.0 minutes/ 7 miles	15.7 minutes	14.3 minutes
35	110 S. Bradford Ave. Placentia, California 92870	15.2 minutes/ 8.88 miles	14.1 minutes/ 8.2 miles	17.5 minutes	16.4 minutes
53	25415 E. La Palma Yorba Linda, California 92887	8.4 minutes/ 4.91 miles	9.0 minutes/ 5.27 miles	10.7 minutes	11.3 minutes

* Based on an estimated average emergency response travel speed of 35 mph.
** Option 2A includes a calculated travel time to the most remote structure of 4 minutes 37 seconds from Station 32. Other responding stations would be proportionately longer (roughly 36 seconds).

Fire protection, suppression, inspection, and paramedic emergency medical services for the project site and vicinity are provided by OCFA. The Operations and Training Division is responsible for providing fire control and suppression, rescue, medical aid, and paramedic services in the city.

OCFA's response time goal is for the first unit to arrive on scene within five (5) minutes for 80% of the emergency calls for service. The truck company response goal is to arrive on scene within twelve (12) minutes. Total effective force (full first alarm assignment) is expected on site within ten (10) minutes 30 seconds.

As depicted in Table 3, there are several OCFA Stations that may respond to structure fires and wildfires or medical/rescue emergencies at the Esperanza Hills site. However, one primary station, Fire Station No. 32, would be capable of reaching the project (most remote structure) within 5 minutes for all three Options (1, 2, and 2A), meeting OCFA's response time objective.

This station is not within the 1.5 mile response standard established by the Insurance Services Office (ISO) and will not benefit the project with regard to insurance ratings. The remaining OCFA responders would not reach the project in less than approximately 6.5 minutes, which would be within typical Effective Response (First Alarm) timeframes. However, Stations 10 and 53 can respond within 10 minutes, meeting OCFA's goal for EFF.

First responding units would be from Fire Station No. 32 and 53 located at 20990 Yorba Linda Blvd. and 25415 E. La Palma, Yorba Linda, respectively. Station No. 32 houses a three person paramedic assessment unit engine staffed by three firefighters. It also houses a medic van with firefighter paramedics/EMTs. Alternatively, station No. 53 houses a three person paramedic assessment unit engine staffed by three firefighters. In addition to the closest OCFA responding units, engine companies are available from nearby stations and neighboring fire agencies that could arrive within approximately 8–12 minutes under mutual or automatic aid agreements.

2.8 Estimated Calls and Demand for Service from the Project

2.8.1 Estimated Annual and Daily Emergency Calls

The following estimated emergency calls are based upon an interpolation of annual emergency call data for the entire area protected by OCFA. This data was applied to the Esperanza Hills project for anticipated total estimated calls, structure fires, vegetation fires, and emergency medical calls as a comparison, for perspective. The estimated per capita call generation for Esperanza Hills is based upon the development-specific information provided by the project Applicant. The following sections provide an analysis of the estimated call volume and overall impact on the response capability of the existing stations.

2.8.2 Estimated Annual Emergency Call Volume

The following estimated annual emergency call volume at Esperanza Hills is based upon per capita data from total annual OCFA calls (OCFA 2009). The 550 square mile service area calls are summarized below.

- Total population served by OCFA: 1,389,189
- Total annual calls (2009): 85,787. Per capita call generation: 0.06
- Total annual fires: 1,540. Per capita call generation: 0.001
- Total annual EMS/rescue calls: 60,197. Per capita call generation: 0.04 (70% of all calls).
- Total annual other miscellaneous calls: 24,050. Per capita call generation: 0.02

Using the assumptions above, the estimated annual emergency call volume for Esperanza Hills was calculated. In order to provide this conceptual estimate, the proposed development plan was utilized in combination with average population densities derived from U.S. Census Bureau statistics for Yorba Linda for the periods 2007 through 2011 (http://quickfacts.census.gov/qfd/states/06/0686832.html). Yorba Linda averages 2.97 persons per household while the state of California averages 2.91 persons per household. For purposes of this analysis, an average of 3.0 people per dwelling unit is utilized. Based on proposed construction of 334 units (Option 1) or 340 units (Options 2 and 2A), a residential population estimate is calculated at 1,002 or 1,020 persons. This number is a conservative estimate and may be somewhat more than the actual population. Based on this population, the calculated call volumes by type of call are provided in Table 4.

Table 4
Calculated Call Volume (Conceptual Based on up to 1,020 Persons)

Type of call	Per capita call generation factor	Number of estimated annual calls (per day)
Total Calls	0.06	61.2 (0.17)
Total Fires	0.001	1.0 (0.002)
Total EMS/Rescue Calls	0.04	40.8 (0.11)
Total Other Calls	0.02	20.4 (0.06)

As presented, the likely over-estimated call volume generated by Esperanza Hills is up to 61 per year (0.17 per day), with up to 1.0 per year from fire related calls. The majority of the calls will be EMS and service calls. Based on Dudek's experience with analyzing call volumes and types of calls, the estimates calculated herein are likely very conservative because they incorporate data from OCFA jurisdiction-wide statistics which include areas that are not similar to Esperanza Hills (i.e., older neighborhoods with older construction and older codes, different resident population characteristics, wildland, dense urban core, rural, etc.) and components that will not occur at Esperanza Hills.

According to 2009 data, responding engines in the area of the project responded to a light to heavy call volume, depending on the station. Paramedic assessment unit (PAU) engine 32 responded to 2,764 calls, averaging 7.7 calls per day. PAU engine 53 responded to 586 calls, about 1.6 calls per day. For perspective, five calls per day are about average in an urban or suburban area (Hunt 2007). A busy fire station company in an urban area would be 10 calls per day and for suburban stations, one with 8 or more calls per day is considered busy. The non-fire related call volume is higher for OCFA than typical fire stations, with 98% of all calls for non-fire emergencies. The Esperanza Hills development is expected to result in fewer fire calls and about average medical emergency/rescue calls over time. Newer development is less prone to

fire and includes other variables related to the types of activities that will occur and the various restrictions and fire protection features that will reduce fire occurrences.

2.8.2.1 Response Capability Impact Assessment and Mitigation

Based on the potential for up to 59 additional calls per year, fire service levels are not expected to be significantly impacted. Station 32 currently responds to 7.7 calls per day and is the busiest station. Adding 0.17 calls per day is not anticipated to be a significant impact on the station's ability to service Esperanza Hills or existing communities within its primary response area. Station 53 responds to fewer than 2 calls per day and would not be impacted by Esperanza Hills' added call volume.. Therefore, the project is not expected to cause a decline in the OCFA overall response times or service level. Additionally, the requirements described in this FPP are intended to aid firefighting personnel and minimize the demand placed on the existing emergency service system.

2.9 FlamMap Fire Behavior Modeling

Predicting wildland fire behavior is not an exact science due to the many variables that must be considered. As such, the movement of a fire will likely never be fully predictable, especially considering the variations in weather and the limits of weather forecasting and the weather that is often "created" by firestorms. Nevertheless, practiced and experienced judgment, coupled with a validated fire behavior modeling system, results in useful and accurate fire information (Rothermel 1983). To be used effectively, the basic assumptions and limitations of fire behavior modeling applications must be understood.

- First, it must be realized that the fire model describes fire behavior only in the flaming front. The primary driving force in the predictive calculations is the dead fuels less than 0.25 inches in diameter. These are the fine fuels that carry fire. Fuels greater than 1 inch have little effect, while fuels greater than 3 inches have no effect on fire behavior.
- Second, the model bases calculations and descriptions on a wildfire spreading through surface fuels that are within 6 feet of the ground and contiguous to the ground. Surface fuels are often classified as grass, brush, litter, or slash.
- Third, the software assumes that weather and topography are uniform. However, because wildfires almost always burn under non-uniform conditions, creating their own weather, length of projection period and choice of fuel model must be carefully considered to obtain useful predictions.
- Fourth, fire behavior computer modeling systems are not intended for determining sufficient fuel modification zone/defensible space widths. However, it does provide the average length of the flames, which is a key element for determining defensible space distances for minimizing structure ignition.

Although FlamMap has limitations, it can still provide valuable fire behavior predictions, which can be used as a tool in the decision-making process. In order to make reliable estimates of fire behavior, one must understand the relationship of fuels to the fire environment and be able to recognize the variations in these fuels. Natural fuels are made up of the various components of vegetation, both live and dead, that occur in a particular landscape. The type and quantity will depend upon soil, climate, geographic features, and fire history. The major fuel groups of grass, shrub, trees, and slash are defined by their constituent types and quantities of litter and duff layers, dead woody material, grasses and forbs, shrubs, regeneration, and trees. Fire behavior can be predicted largely by analyzing the characteristics of these fuels. Fire behavior is affected by seven principal fuel characteristics: fuel loading, size and shape, compactness, horizontal continuity, vertical arrangement, moisture content, and chemical properties.

The seven fuel characteristics help define the 13 standard fire behavior fuel models (Anderson 1982) and the more recent custom fuel models developed for Southern California (Weise and Regelbrugge 1997). According to the model classifications, fuel models used for fire behavior modeling (BehavePlus, FlamMap, FARSITE) have been classified into four groups, based upon fuel loading (tons/acre), fuel height, and surface-to-volume ratio. Observation of the fuels in the field (on site) determines which fuel models should be applied in modeling efforts. The following describes the distribution of fuel models among general vegetation types for the standard 13 fuel models and the custom Southern California fuel models:

- Grasses – Fuel Models 1 through 3
- Brush – Fuel Models 4 through 7, SCAL 14 through 18
- Timber – Fuel Models 8 through 10
- Logging slash – Fuel Models 11 through 13.

In addition, the aforementioned fuel characteristics were utilized in the recent development of 40 new fire behavior fuel models (Scott and Burgan 2005) developed for use in the BehavePlus, FlamMap, and FARSITE modeling systems. These new models attempt to improve the accuracy of the 13 standard fuel models outside of severe fire season conditions, and to allow for the simulation of fuel treatment prescriptions. The following describes the distribution of fuel models among general vegetation types for the 40 new fuel models:

- Non-burnable – Models NB1, NB2, NB3, NB8, NB9
- Grass – Models GR1 through GR9
- Grass shrub – Models GS1 through GS4

- Shrub – Models SH1 through SH9
- Timber understory – Models TU1 through TU5
- Timber litter – Models TL1 through TL9
- Slash blowdown – Models SB1 through SB4.

Table 5 provides a description of 7 fuel models (including one non-burnable model) coded for the site that were subsequently used in the on-site FlamMap analysis for this project.

Table 5
On-Site Fuel Model Characteristics

Fuel Model	Description	Land Cover Classification	Canopy Cover Value
0	Non-burnable	Graded	0
1	Tall grass	Annual Grassland, Ruderal, Savannah	0
8	Closed Timber Litter	Southern Willow Scrub	3
9	Hardwood Litter	Coast Live Oak Forest	3
GS2	Moderate Load, Dry Climate Grass-Shrub	Elderberry and Walnut Woodland, Mulefat Scrub	0
SCAL 18	Coastal Sage Scrub	Sage and Monkeyflower Scrub	0
SH5	High Load, Dry Climate Shrub	Chaparral	0

2.9.1 FlamMap Analysis

FlamMap software was utilized to graphically depict potential fire behavior for the project site. FlamMap utilizes the same fire spread equations built into the BehavePlus software package, but allows for a geographical presentation of fire behavior outputs as it applies the calculations to each pixel in the associated GIS landscape (Finney 1998). Both summer weather conditions (on-shore flow) and more extreme fall weather conditions (off-shore, Santa Ana conditions) were modeled for both the existing site condition and the proposed post-development site condition.

FlamMap software requires a minimum of five (5) separate input files that represent field conditions in the analysis area, including elevation, slope, aspect, fuel model, and canopy cover. Each of these files was created as a raster GIS file using ArcGIS 10.1 software, exported as an ASCII grid file, then utilized in creating a FARSITE Landscape file that served as the base for the FlamMap runs. The resolution of each grid file and associated ASCII file that was used in the models described herein is 3 meters, based on digital terrain data available from the United States Geological Survey (USGS). In addition to the Landscape file, wind and weather data are

incorporated into the model inputs. The output fire behavior variable chosen for each of the modeling runs was flame length, measured in feet.

The following paragraphs provide descriptions of the input and output variables used in processing the FlamMap models. In addition, data sources are cited and any assumptions made during the modeling process are described.

Elevation

Elevation data were derived from digital terrain data publicly available from USGS, projected in North American Datum 1983, California State Plane, Zone 6 with units in feet. The resolution of the file was 3 meters and elevation within the analysis area ranges from 558–1,540 feet above mean sea level (AMSL). These data were utilized to create an elevation grid file, using units of feet above sea level. The elevation data are a required input file for FlamMap runs and are necessary for adiabatic adjustment of temperature and humidity and for conversion of fire spread between horizontal and slope distances.

Slope

Using ArcGIS Spatial Analyst tools, a slope grid file was generated from the elevation grid file described above. Slope measurements utilized values in percent of inclination from horizontal. Slope values in the analysis area range from 0–118%. The slope input file is necessary for computing slope effects on fire spread and solar radiance.

Aspect

Using ArcGIS Spatial Analyst tools, an aspect grid file was generated from the elevation grid file described above. The aspect values utilized were azimuth degrees. Aspect values are important in determining the solar exposure of grid cells.

Fuel Model

Vegetation coverage data in the form of a GIS shapefile (Glenn Lukos 2013) were used in this analysis to create a fuel model file for existing conditions, which was derived from vegetative cover data mapped for the analysis area (on-site and within off-site development areas). Vegetation mapping data was utilized in field efforts to classify vegetation cover type with an appropriate fuel model. Fuel model assignments for existing vegetation are presented in Table 1.

To analyze post-development fire behavior for Options 1, 2, and 2A, three separate fuel model shapefiles were created (one for each option) using the existing vegetation coverage and reclassifying fuels based on location within the proposed development. All fuels within areas proposed for conversion to non-fuel types (e.g., roads, driveways, structures) were reclassified as Fuel Model "0" to represent developed, non-combustible land uses. Post-development fuel model classification for non-developed areas within the project site were classified as follows:

- Fuel Modification Zone A: Fuel Model 8
- Fuel Modification Zone B: Fuel Model GR1
- Fuel Modification Zone C: Fuel Model GS2
- Fuel Modification Zone A: Fuel Model 5
- Irrigated Slopes: Fuel Model 8
- Shaded Fuel Break: Fuel Model TU2
- Parks: Fuel Model GR1
- Landscaped Slopes: Fuel Model 8

Table 6 provides a description of 10 fuel models (including one non-burnable model) coded for the post-development site condition (including developed and non-developed areas) that were subsequently used in the on-site, post-development FlamMap analysis for this project.

Table 6
On-Site Fuel Model Characteristics for Post-Development Condition

Fuel Model	Description	Land Cover Classification	Canopy Cover Value
0	Non-burnable	Developed	0
1	Short Grass	Grassland, Ruderal, Savannah	0
5	Brush	FMZ D	0
8	Closed Timber Litter	Irrigated Slopes, FMZ A, Southern Willow Scrub	2 (Irrigated Slopes), 0 (FMZ A)
9	Hardwood Litter	Coast Live Oak Forest	3
SCAL18	Sage/Buckwheat	Scrub	0
GR1	Short, Sparse Dry Climate Grass	Parks, FMZ B	2 (Parks), 0 (FMZ B)
GS2	Moderate Load, Dry Climate Grass-Shrub	FMZ C, Woodlands, Mulefat Scrub	0
SH5	High Load, Dry Climate Shrub	Chaparral	0
TU2	Moderate Load, Humid Climate Timber-Shrub	Shaded Fuel Break	2

Once fuel model values were assigned to vegetation or land cover types, the vector-based vegetation data files (existing and proposed) were converted to grid files for inclusion in FlamMap modeling.

Canopy Cover

Canopy Cover is a required raster file for FlamMap operations. It is necessary for computing shading and wind reduction factors for all fuel models. Canopy cover is measured as the horizontal fraction of the ground that is covered directly overhead by tree canopy. Crown closure refers to the ecological condition of relative tree crown density. Stands can be said to be "closed" to recruitment of canopy trees but still only have 40% or 50% canopy cover. Coverage units can be categories (0–4) or percentage values (0–100).

For the purposes of the FlamMap analysis, Dudek utilized vegetation type classifications to determine canopy cover assignments. Canopy cover assignments are presented in Tables 1 and 6, by fuel model.

Weather

In order to utilize weather and fuel moisture variables for the project site, data from the Fremont Canyon Remote Automated Weather Station (RAWS) was analyzed. Utilization of RAWS data is necessary for fire behavior modeling as it includes data for fuel moisture conditions, and, as of the date of this report, no RAWS are located on the project site. The Fremont Canyon RAWS is located approximately 6 miles to the south of the Esperanza Hill property. The following summarizes the location and available data ranges for the Fremont Canyon RAWS:

- Latitude: 33.811139
- Longitude: -117.708361
- Elevation: 1,781 feet
- Data years: 1995–2012.

Wind and weather data are a required component to fire behavior modeling efforts. The Fremont Canyon RAWS data was processed with the FireFamily Plus v. 4.1.0 (FireFamily Plus 2007) software package to determine summer (50th percentile) and fall (97th percentile) weather conditions to be incorporated into the Initial Fuel Moisture file used as an input in FlamMap. Wind direction and wind speed values for the two FlamMap runs were manually entered during the data input phase. All other weather data were held constant for each of the FlamMap runs. Table 7 summarizes weather and fuel moisture data inputs used for both summer and fall weather conditions.

Table 7
FlamMap Weather Input Variables

Model Variable	50th Percentile Weather	97th Percentile Weather (w/ Max. Wind)
1 h fuel moisture	6%	2%
10 h fuel moisture	8%	3%
100 h fuel moisture	13%	7%
Live herbaceous moisture	60%	30%
Live woody moisture	90%	59%
20 ft. wind speed (mph)	9 mph	32 mph
Wind direction	225 degrees	45 degrees
Slope steepness	Variable by location	Variable by location

mph = miles per hour

Regional Fire Behavior Analysis

In addition to the site-specific FlamMap analysis conducted for the Esperanza Hills project, an analysis of regional fire behavior was conducted to evaluate the impact of proposed development and associated land cover and vegetation changes. To evaluate regional fire behavior, a FARSITE landscape file (.lcp) for the region was obtained from the Landscape Fire and Resource Management Planning Tools (LANDFIRE) data set available via the United States Forest Service (USFS) and the United States Department of Interior (DOI). Resolution of this data set was 30 meters and included fuel classifications based on Anderson's (1982) 13 standard fuel models. Utilizing the same fuel moisture and wind speed and direction values described above, the LANDFIRE landscape file was utilized in the FlamMap software package to evaluate potential flame lengths in the region and was conducted for summer (50th percentile) and fall (97th percentile) weather conditions.

2.9.2 FlamMap Fuel Model Outputs

One output grid file was generated for each of the FlamMap runs (site specific and regional), and represents flame length (feet) in existing and proposed site conditions during summer and peak weather scenarios. Flame length, the length of the flame of a spreading surface fire within the flaming front, is measured from midway in the active flaming combustion zone to the average tip of the flames (Andrews, Bevins, and Seli 2005). It is a somewhat subjective and non-scientific measure of fire behavior, but is extremely important to fireline personnel in evaluating fireline intensity and is worth considering as an important fire variable (Rothermel 1991). The information in Table 8 presents an interpretation of flame length and its relationship to fireline intensity.

Table 8
Fire Suppression Interpretation

Flame Length (feet)	Fireline Intensity (Btu/ft/s)	Interpretations
Under 4	Under 100	Fires can generally be attacked at the head or flanks by persons using hand tools. Hand line should hold the fire.
4–8	100–500	Fires are too intense for direct attack on the head by persons using hand tools. Hand line cannot be relied on to hold the fire. Equipment such as dozers, pumpers, and retardant aircraft can be effective.
8–11	500–1,000	Fires may present serious control problems—torching out, crowning, and spotting. Control efforts at the fire head will probably be ineffective.
Over 11	Over 1,000	Crowning, spotting, and major fire runs are probable. Control efforts at head of fire are ineffective.

Source: BehavePlus 3.0.2 fire behavior modeling program (Andrews, Bevins, and Seli 2004)

Maps depicting flame length values for the peak (fall) weather scenario for Options 1, 2, and 2A are included in Figures 7, 8 and 9, respectively. This figure also presents the LANDFIRE analysis-generated flame length values for the region. The fire behavior modeling results vary depending on topography and fuel type. As FlamMap utilizes site-specific digital terrain data (including slope, vegetation, aspect, and elevation data) slight variations in predicted flame length values can be observed based on fluctuations of these attributes across the landscape. As presented, wildfire behavior in each of the fuel types varies depending on weather conditions.

When classifying vegetation types into fuel models, efforts were made to most accurately represent the fuel type observed. However, the scale at which the vegetation mapping was conducted did not allow for small-scale fuel mapping within a larger vegetation type classification. For example, small pockets of tall grass within a larger area classified as scrub were not separated for this analysis. Second, the fuel models selected to represent post-developed conditions were selected based on expected fire behavior in these fuel types, as no available fuel models exist for managed and/or irrigated landscape vegetation.

2.9.3 Fire Potential

Given the climatic, vegetation, and topographic characteristics of the analysis area, along with the fire behavior modeling results discussed herein, the project site is considered potentially vulnerable to wildfire starting in, burning onto, or spotting onto the site. Based on the FlamMap modeling conducted for the Esperanza Hills property, maximum flame lengths during a summer fire (50th percentile weather) are modeled at 19 feet and maximum flame lengths during a fall fire (97th percentile weather) are modeled at 41 feet. The fire behavior results described herein depict values based on inputs to the FlamMap software. Localized changes in slope, weather, or

pockets of different fuel types are not accounted for in this analysis, but assumed across the landscape based on the available data resolution. Further, this modeling analysis assumes a correlation between the available vegetation data and fuel model characteristics. Wildfire activity may temporarily alter fuel beds, but fire behavior modeling efforts conducted for this site assume natural succession of burned areas to more mature stand conditions, resulting in a conservative (near worst-case) estimate of fire behavior. Since fire behavior for a given location will be affected by many factors, including unique weather patterns, small-scale topographic variations, or changing vegetation patterns, modeling results are applicable as a basis for planning, but need to be considered in context with other site variables.

2.9.4 Regional Fire Behavior

While the FlamMap analysis conducted in support of this FPEP focuses on potential fires burning on the Esperanza Hills site and the vicinity, a Santa Ana wind driven fire burning within adjacent open space may result in embers landing on site. Ember-caused ignitions rely on embers landing in a susceptible fuel bed (e.g., dry grass), but may also ignite unprotected structures directly if they penetrate roofing and siding (e.g., via roof vents). The importance of off-site ember production at the Esperanza Hills site is related to evacuation trigger thresholds, which are discussed later in this FPEP. Structural ignitions within older communities of Yorba Linda resulting from upwind ember sources were documented during the 2008 Freeway Complex Fire (OCFA 2008).

Specifically, four Yorba Linda areas suffered structural loss and damage during the Freeway Complex Fire (Hidden Hills and Box Canyon, Dorinda and San Antonio, Stonehaven, and Camino de Bryant and Cross Creek). The structure losses were determined to be primarily from ember penetration into attic spaces. Fuel modification, where maintained to initial specifications, performed as intended by reducing radiant heat and avoiding direct flame impingement. The structures lost throughout these areas have been rebuilt to at least the 2007 ignition resistant building standards, which has a net benefit throughout these communities by reducing the number of vulnerable structures.

Structures in the Esperanza Hills community will be built with embers as one of the primary focus areas for protection and a layered system of fire protection that will result in the ability of the structures and community to withstand significant fire, enabling responding firefighting resources to focus on more vulnerable areas. This same strategy was employed during the Freeway Complex Fire where the Casino Ridge neighborhood (built in 1996 to the Yorba Linda special fire hazard area codes) and including a relatively new fuel modification standard (now required) enabled OCFA to focus on areas where structures were not as protected and fuel modification not as formal (OCFA 2008).

Structure losses in some Yorba Linda areas were also attributed to lack of water for firefighting purposes. Portions of the Yorba Linda Water District rely on booster stations to provide water at the hydrant. During the Freeway Complex Fire, the booster station and backup generator failed, resulting in no water availability in certain hydrants.

The Esperanza Hills project provides for a system upgrade by providing two on-site water reservoirs. The proposed system will make available gravity fed water supply to the project's consumers and hydrants, benefitting this site and off-site, neighboring areas. The result is an improved system that will provide reliable water supply during wildfires.

Yorba Linda areas located adjacent the Esperanza Hills project will directly benefit from reduced wildfire risk with the construction of the project. The project will act as a large wildfire buffer for these communities and provide improved water availability and reliability, as described further in following sections.

2.10 On-Site and Vicinity Risk Assessment

As determined during the analysis of this site and its fire environment, the Esperanza Hills site and its vicinity, in its current condition, is considered potentially vulnerable to wildfire starting in, burning into, or spotting into the site fuels, as it did during the 2008 Freeway Complex fire. The location's proximity to off-site wildland areas that are prone to fire, such as the Chino Hills State Park, numerous ignition sources and given the climatic, vegetation, WUI location, and topographical characteristics of the area, along with the fire history and fire behavior modeling results previously discussed in this FPEP, combine to heighten the potential risk of wildfire. Under favorable weather conditions, a lower intensity fire can move through the non- indigenous grass ground cover, burning quickly, but with lower flame lengths. Areas that will revegetate with sage scrub have the potential to produce moderate to high intensity fire. Under extreme conditions, catastrophic wildfire could result as grass/understory fires burn into ladder fuels or heavier fuels, driven by high winds. A typical cause for wildfire in the Esperanza Hills vicinity may be related to roadways (tossed cigarette, vehicle accidents, catalytic converter, or car fire), power lines, unattended teenagers/children, arson, or gas powered mowers, trimmers or other equipment.

Once constructed, the Esperanza Hills property's on-site fire potential will be significantly lower than in its current condition. Flammable landscapes will be converted to ignition resistant materials including protected structures, maintained and irrigated landscapes, roadways, parks, and other managed landscapes. Likewise, the fire risk in the general vicinity, especially to the south, east, and west, will be reduced. The project converts fuels that carried fire and produced significant embers during the Freeway Complex Fire that ultimately resulted in structure losses

to managed landscapes. The significant canyons (particularly Blue Mud Canyon) which helped funnel the fire toward Yorba Linda will be significantly improved (from a fire and habitat perspective) through restoration activities to remove non-native, flammable vegetation and provide native, riparian vegetation and also, in key areas, to create large fuel modification areas (fuel breaks) that were strategically located with the assistance of OCFA and that will result in reduced fire intensity and spread rates along the southern project boundary in Blue Mud Canyon (Figure 7, 8, and 9).

The following section presents measures required and specifically formulated for the Esperanza Hills project that will result in improved fire safety conditions at the site and that specifically mitigate risks identified in this analysis.

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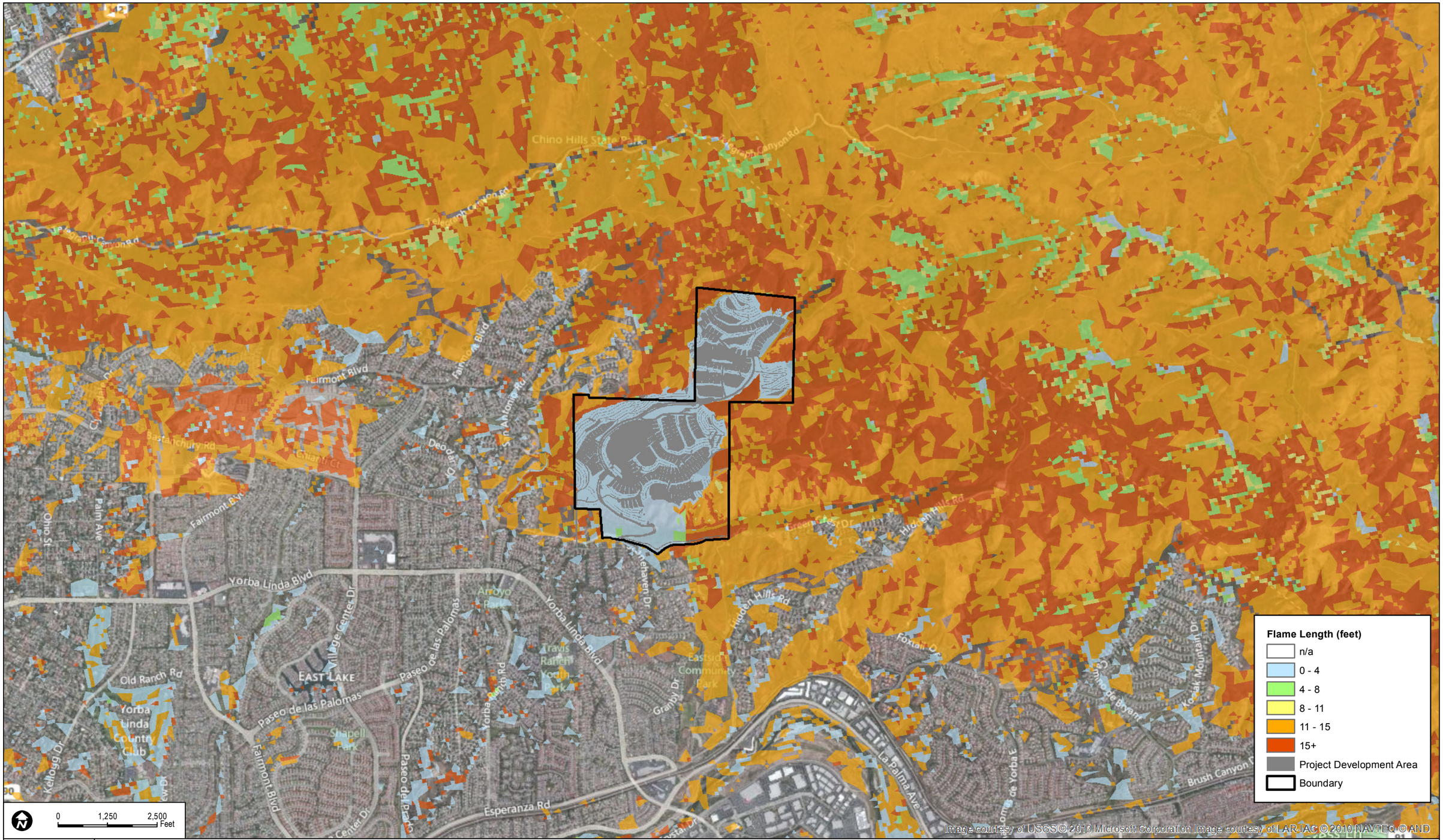

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FIGURE 7

FlamMap Fire Behavior Analysis, Option 1 - Flame Length, Fall Fire

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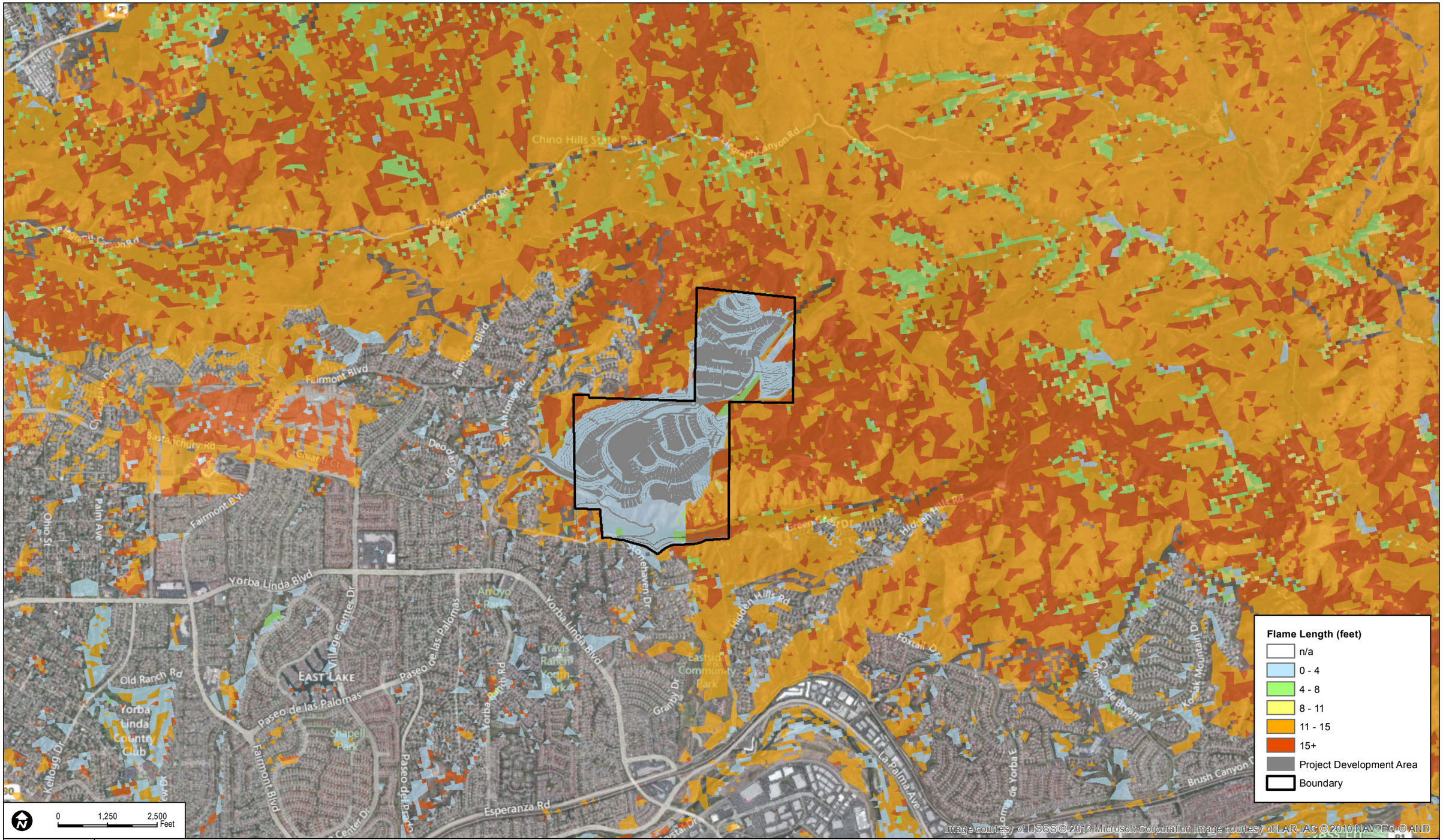

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FIGURE 8

FlamMap Fire Behavior Analysis, Option 2 - Flame Length, Fall Fire

ESPERANZA HILLS FIRE PROTECTION AND EMERGENCY EVACUATION PLAN

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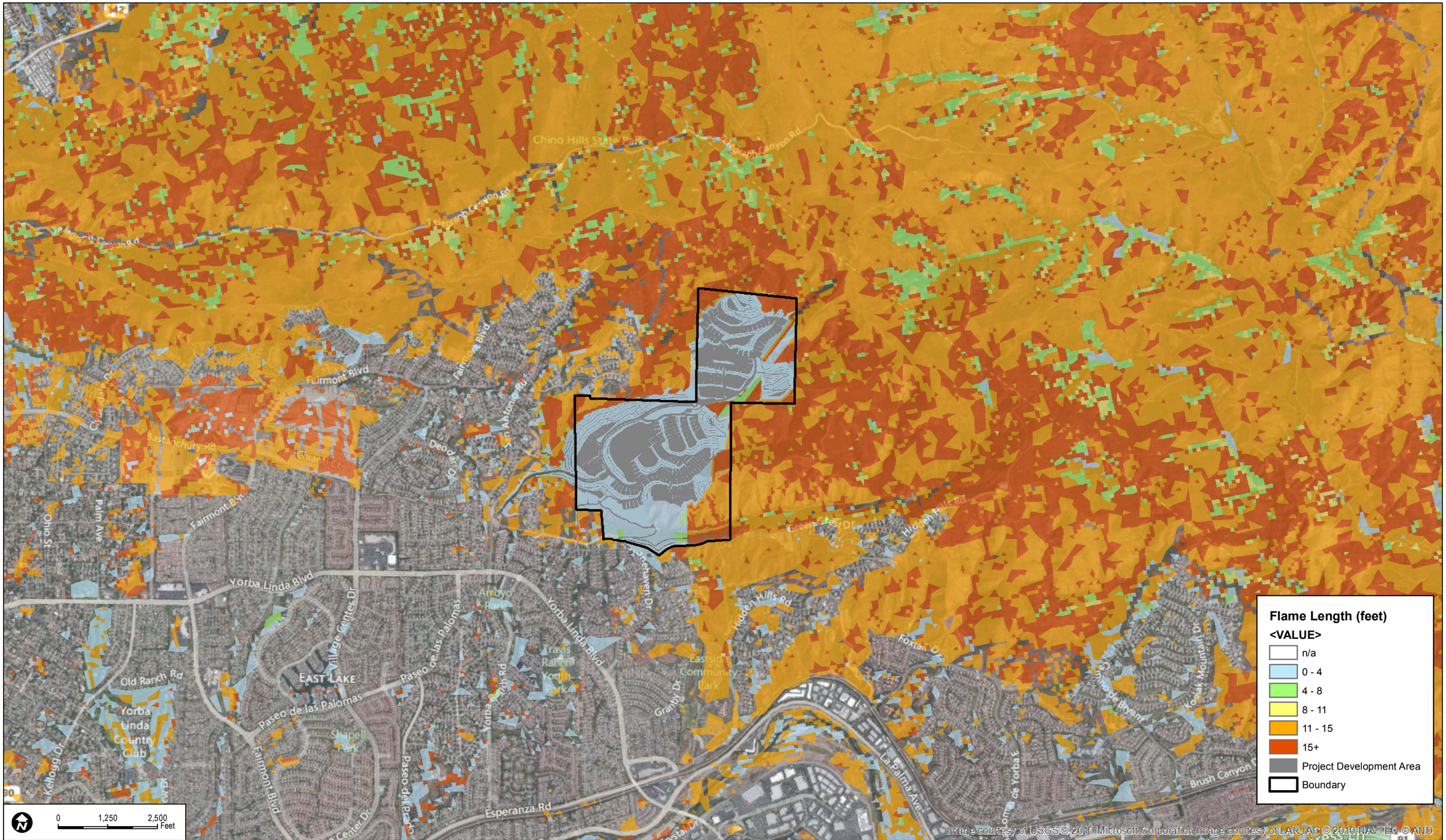

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FIGURE 9

FlamMap Fire Behavior Analysis, Option 2A - Flame Length, Fall Fire

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3.0 FIRE SAFETY REQUIREMENTS

The following sections describe general concepts for the Project site's fire protection features including fuel modification zones, ignition resistant building requirements, and infrastructure. Specific project details will be provided in the Esperanza Hills fire master plan and project AM&M report, which will incorporate OCFA input.

3.1 Fuel Modification Zones

3.1.1 Zones and Permitted Vegetation

As indicated in preceding sections of this FPEP, an important component of a fire protection system is the fuel modification area. Fuel modification areas are designed to gradually reduce fire intensity and flame lengths from advancing fire by strategically placing thinning zones and irrigated zones adjacent to each other on the perimeter of the community's WUI exposed structures. Therefore, the fuel modification area is an important part of the fire protection system designed for this site.

Predicted flame lengths vary throughout the site and adjacent to fuel modification zones, based on slope and vegetation characteristics. These variations were analyzed as were the site's specific features and conditions which complement and augment the proposed fuel modification areas. Fire behavior modeling, as previously described, was used to predict flame lengths and was not intended to determine sufficient fuel modification zone widths. However, the results of the modeling do provide important information which is a key element for determining distances for minimizing structure ignition and providing "defensible space" for firefighters.

Fuel modification is proposed for the entire exterior perimeter of the proposed development areas as well as for interior slopes. As discussed in the following sections, a minimum of 170 feet of fuel modification area is required by OCFA (OCFA 2011). Fuel modification will typically consist of OCFA Zones A, B, C and D, which are installed within the property boundaries. The majority of the FMZs will be located on site. However, due to the amount of land necessary for fuel modification, ten lots will require portions of the B, C, and D zones to extend onto adjacent properties. Three of these lots will require alternative materials and methods since achievement of a full 170 feet of fuel modification is not possible.

The proposed fuel modification areas are at minimum four times the predicted maximum flame lengths (97th percentile) and up to 8 times wider than the predicted flame lengths (50^{th} percentile). The fuel modification area works in tandem with the other components of the fire protection system including ignition-resistant construction, interior automatic fire sprinklers (with attic heads in each structure), infrastructure upgrades, and water supply, among others, to provide enhanced ignition resistance and protection for the site's structures.

3.1.2 Fuel Modification Zone Requirements

The following description summarizes the Fuel Modification Zone configuration proposed for Esperanza Hills. These zones are presented graphically in Appendices C and D for Options 1 and 2/2A, respectively. In addition, an Approved Plant List is provided in Appendix E and a Prohibited Plant list is provided in Appendix F.

3.1.2.1 Fuel Modification Zone Requirements

Zone A – Irrigated Structure Setback Zone

Zone A is applicable site wide for every perimeter structure. Zone A will be 20 feet wide and contained within the private lot. This zone will be planted with drought-tolerant, fire resistive plants from OCFA's –approved plant palette. Zone A includes the following key components in addition to the OCFA Zone A requirements (project fuel modification plan details requirements for each zone):

- Automatic irrigation system throughout the fuel modification zone to maintain hydrated plants without over-watering or attracting nuisance pests.
- Trees and tree-form shrub species not allowed within 10 feet of combustible structures (measured from the edge of a full growth crown). Back yard/side yard areas are set back from the fuel modification areas by a typical Zone A and shall be maintained to Zone A standards.
- Maintenance including ongoing removal and/or thinning of undesirable combustible vegetation, replacement of dead/dying plantings, maintenance of the programming and functionality of the irrigation system, regular trimming to prevent ladder fuels.
- A minimum of 36 inches of horizontal clearance and unlimited vertical clearance around the exterior of the structure (360°) provided for firefighter access. Within this clearance area, landscape such as low ground covers and shrubs are permitted so long as their placement and mature height to do not impede firefighter access, consistent with purpose of this guideline.
- No combustible construction (structures) allowed in Zone A (first 20 feet from structure).
- No permanent or portable barbeques/grills, fire pits, fireplaces or other flame generating devices permitted within 10 feet of plants/vegetation.
- Mulch within first 5 feet from structure restricted to non-flammable materials such as stone, rock, concrete, bare soil, or other.
- Vegetation/Landscape Plan prepared and submitted in compliance with this Plan.

Zone B – Irrigated Zone

Zone B is an irrigated zone that adjoins Zone A, and is a minimum of 50 feet in width. Zone B shall be cleared of undesirable plant species and re-planted with drought-tolerant, fire resistive plant material from the OCFA approved plant list. Irrigation systems shall be designed and maintained to address best water conservation practices and include methods of erosion control to protect against slope failure. All irrigation shall be kept a minimum of 20 feet from the drip line of all native oak species. Specific maintenance requirements are as follows:

1. Automatic irrigation system throughout the fuel modification zone to maintain hydrated plants without over-watering or attracting nuisance pests.
2. Grasses shall be cut to 4 inches in height. Native grasses can be cut after going to seed.
3. Trees and tree-form shrub species that naturally grow to heights that exceed 2 feet shall be vertically pruned to prevent ladder fuels.
4. Maintenance including ongoing removal and/or thinning of undesirable combustible vegetation, replacement of dead/dying plantings, maintenance of the programming and functionality of the irrigation system, regular trimming to prevent ladder fuels.
5. No combustible construction (structures) allowed within Zone B.
6. No permanent or portable fire pits, fireplaces or other flame generating devices that burn wood.

Zone C and D – Thinning Zones (Non-Irrigated)

Thinning Zones reduce the fuel load of a wildland area adjacent to Zones A and B, and thereby, reduce heat and ember production from wildland fires. Thinning zones adjoin Zone B and extend 100 feet into the WUI. For Esperanza Hills, Zone C is 50 feet and requires a minimum of 50% thinning or removal of plants. Whereas, Zone D is 50 feet in width and requires a minimum of 30% thinning or removal of plants. Zone C and D specific maintenance requirements are as follows:

1. Grasses shall be cut to 4 inches in height. Native grasses can be cut after going to seed.
2. Trees and tree-form shrub species that naturally grow to heights that exceed 4 feet shall be vertically pruned to prevent ladder fuels.
3. Maintenance including ongoing removal and/or thinning of undesirable combustible vegetation, replacement of dead/dying plantings, and regular trimming to prevent ladder fuels.

4. Plant species introduced into Zone C and D shall be selected from the approved OCFA plant list
5. Reduce fuel loading by reducing fuel in each remaining shrub or tree without substantial decrease in the canopy cover or removal of tree holding root systems. Maintain sufficient cover to prevent erosion without requiring planting. Root systems of undesirable species will be removed unless a geology report indicates the need to retain them for soil stability/erosion control.

3.1.2.2 Other Vegetation Management

A. Strategic Fuel Breaks

The Esperanza Hills project team met with OCFA to discuss the site plan and determine where fuel breaks could be provided on the property to provide for additional protection for the project and for existing communities/neighborhoods adjacent to the Esperanza Hills site. To that end, fuel breaks are provided on the south and southwestern portions of the property within Blue Mud Canyon. The fuel break includes maintained fuel reduction and in effect, becomes an extension of the formal fuel modification zone provided for the project. This fuel break will significantly affect fire behavior (spread rates and intensity) in this portion of the canyon and is expected to provide substantial benefits for neighborhoods south and west in Yorba Linda. Figures 7, 8 and 9 and Appendices C and D illustrate the effect this fuel break has on fire behavior.

B. Roadside Fuel Modification Zones

Roadside FMZs will be provided and maintained for all project roads and designated fire department access roads. Roadside fuel modification zones will be 10–20 feet wide from edge of road on both sides of roadways adjacent natural open space areas.

The type of fuel modification and maintenance required for roadsides throughout the Esperanza Hills project include:

1. No use of prohibited plants (Appendix F).
2. No continuous tree canopies (canopies must be interrupted through tree spacing of 20 feet between mature canopies).
3. Grass will be mowed to 4 inches.
4. No dry grass within fuel modification zone.
5. Single specimen trees, fire-resistive shrubs, or cultivated ground cover (such as green grass, succulents, or similar plants) may be used, provided they do not form a means of readily transmitting fire.

6. Trees may be placed within the Roadside Vegetation Management Zones. The following criteria must be followed:
    a. Tree spacing to be 20 feet between mature canopies (30 feet if adjacent to a slope steeper than 41%).
    b. Trees must be limbed up one-third the height of mature tree or 6 feet, whichever is greater.
    c. No tree canopies lower than 13 feet 6 inches over roadways.
    d. No tree trunks intruding into roadway.
    e. No trees will be planted that are listed on the Prohibited Plant List (Appendix F). No flammable understory is permitted beneath trees. Any vegetation under trees to be fire resistive and kept to 2 feet in height or below, and no more than one-third the height of the lowest limb/branch on the tree.
    f. No tree limbs/branches are permitted within 10 feet of a structure.
    g. No vegetation found on the Prohibited Plant List (Appendix F) will be planted or remain in this zone.

C. Parks and Greenways

Fire Safe Vegetation Management is recommended within parks and other greenway areas in compliance with the guidelines in this plan.

1. Grasses must be maintained/mowed to 4 inches.
2. Types and spacing of trees, plants and shrubs, to comply with the criteria in this plan.
3. Areas will be maintained free of down and dead vegetation.
4. Trees to be properly limbed and spaced and will not be of a prohibited type.
5. No species from the Prohibited Plant List included (Appendix F).

D. Interior Manufactured Slopes

Interior slopes will be considered "Vegetation Management Areas." These internal slopes will include:

Specific Requirements

1. The irrigation and maintenance requirements of standard fuel modification zones apply to these areas.

2. The area is completely irrigated or the area is adequately separated from structures.
3. There is a noncombustible setback zone of 20 feet from all structures (see Zone A requirements).
4. Only trees and shrubs from the Fuel Modification Zone Plant List, and planted in accordance with spacing requirements, can be used within the first 30 feet from any structure.
5. Selected Pine, Palm, and Eucalyptus species must be a minimum of 30 feet from all structures (measured from mature canopy growth to the structure) and planted in clusters of no more than 5–7 trees per cluster with 30 feet between clusters. The areas between the clusters may be planted with allowable plants.
6. Vegetative under-story must not create a fuel ladder or create the potential for ground fires. Trees shall be limbed up to three times the height of the under-story vegetation height or no vegetation taller than 2 feet in height within 15 feet of trees is allowed.
7. Any plants proposed from the OCFA undesirable list shall be reviewed through an Alternate Means of Protection process to determine the plants suitability, including spacing requirements, within the project boundary area.

E. Vacant Parcels and Lots

1. Vacant Lots will not be required to implement Vegetation management strategies until construction begins. However, perimeter Vegetation Management Zones must be implemented prior to commencement of construction utilizing combustible materials.
2. Prior to issuance of a permit for any construction, grading, digging, installation of fences, the outermost 30 feet of the lot is to be maintained as a Vegetation Management Zone. Install fence at edge of pad adjacent habitat areas.
3. Existing flammable vegetation will be reduced by 60% on vacant lots upon commencement of construction on each lot; no vegetation clearing in adjacent open space will occur.
4. Dead fuel, ladder fuel (fuel which can spread fire from ground to trees), and downed fuels will be removed and trees/shrubs will be properly limbed, pruned and spaced per this plan.
5. The remainder of the Vegetation Management Zones required for the particular lot will be installed and maintained prior to combustible materials being brought onto any lot under construction.

F. Environmentally Sensitive Areas/Open Space/Riparian Areas

In environmentally sensitive areas that contain sensitive habitat, cultural sites, riparian areas, biological buffer areas, detention basins, etc., permission will be needed from the County, and the appropriate resource agencies (California Department of Fish and Game (CDFG), U.S. Fish and Wildlife Service (USFWS), Army Corps of Engineers (ACOE) prior to any vegetation management activities occurring.

This FPEP pertains to the disturbed portions of the project including the direct project footprint and the fuel modification zones. Preserved open space areas, habitat areas, restoration sites, and all other vegetated areas outside the project footprint and fuel modification zone are not subject to the requirements of this FPEP.

G. Private Lots/Undesirable Plants

None of the plant materials listed in Appendix F (Undesirable Plant Species will be planted on private lots that are exposed to the WUI (this includes all lots in the community, due to potential for ember production during wildfire). Esperanza Hills HOA will provide that list and other recommendations to all buyers in a private property owners' guide to fire safe vegetation management on private lots. Deed restrictions will be recorded against private lots including any portion of the fuel modification zones on the private lot, including approved plant palettes, and prohibitions regarding combustible structures, including fencing and other accessory structures. Deed restrictions will run with the land and be conveyed to any subsequent owner of the private lot. In addition the project Covenants, Conditions, and Restrictions (CC&Rs) will include a reference to the FPEP to ensure compliance with the FPEP. Owners of private lots will be notified in the project's CC&Rs and property disclosures that they are prohibited from conducting any vegetation management activities outside their private property.

3.1.2.3 Maintenance

Provisions for continuous maintenance will be addressed in the Esperanza Hills Homeowner Association's (HOA) Covenants, Conditions, and Restrictions for common areas and individual properties. Maintenance refers to anything needed to maintain the fuel modification area in a fire-safe condition as required by OCFA, including periodical removal of undesirable, combustible vegetation; replacement of dead and dying fire-resistant plantings; maintenance of the operational integrity and programming of irrigation systems; and preservation of identification markers.

Fuel management activities will be completed annually by June 1st and more often as needed for fire safety, as determined by OCFA. The project Applicant will provide definition as to the details of the funding entity or entities responsible for long term maintenance of fuel

modification areas. An HOA will be established to provide funding for inspection and monitoring within the FMZ.

The HOA will be responsible for and have the authority to ensure long term funding, and ongoing compliance with all provisions of this FPEP, including vegetation planting, fuel modification (OCFA or another entity may inspect and enforce fuel modification requirements), vegetation management, and maintenance requirements on all private lots, multifamily residences, parks, common areas, roadsides, and open space under their control (if not considered biological open space). Any water quality basins, flood control basins, channels, and waterways should be kept clear of flammable vegetation, subject to the environmental restrictions mentioned in item D above.

As identified in the OCFA Freeway Complex Fire After Action Report (2008), maintenance of fuel modification areas has been a challenge throughout the WUI areas of Orange County. To mitigate that challenge, the HOA will annually fund and obtain an inspection and report from an OCFA-approved Wildland Urban Interface Fire Safety Inspector in June, certifying that vegetation management activities throughout the Project Site have been performed pursuant to this plan. This report will be funded by the Approved Maintenance Entity and submitted to OCFA for approval. The inspection will include observation and reporting of potential fire issues observed throughout the community.

3.1.2.4 Construction Phase Fuel Management

Vegetation management requirements will be implemented at commencement and throughout the construction phase. Vegetation management will be performed pursuant to OCFA on all lots or areas prior to the start of work and prior to any import of combustible construction materials. Adequate fuel reductions will occur through thinning, mowing, or blading around all grading, site work, and other construction activities in areas where there is flammable vegetation.

In addition to the requirements outlined above, the project will comply with the following important risk reducing vegetation management guidelines:

1. All new power lines will be underground, for fire safety during high wind conditions or during fires on a right of way which can expose aboveground power lines.
2. Fuel modification zones cannot extend beyond the private lot or development without written, legal, permission of off-site landowners, and will not extend into biological open space or other sensitive biological areas, or other areas controlled by the County and/or resource agencies without first having written formal permission from all applicable agencies.

3. Caution must be used to avoid erosion or ground (including slope) instability or water runoff due to vegetation removal, vegetation management, maintenance, landscaping, or irrigation. No uprooting of treated plants is necessary.
4. All structures will be in strict, ongoing compliance with all County and other applied Fire and Building Code requirements.

3.1.2.5 Off-Site Fuel Modification

The majority of the FMZs will be located within the boundaries of the proposed development, except for Lots 224, 225, 236, 237, 253, 254, and 278 in Option 1 (Figure 10), which require off-site fuel modification (Option 2 and 2A corresponding numbered lots would be 8, 9, 10, 224, 225, 236, 237, 253, 254, and 278) (Figures 11 and 12). Esperanza Hills has acquired a fuel modification easement with the adjacent land owner (Friend Property) for Option 1, Lots 218-219, 230-231, 247-248, and 272 or the corresponding Option 2 and 2A lot numbers. As of this report's preparation date, a fuel modification easement has not been granted for Option 1 lots 7-9 (Option 2, lots 8-10) where FMZs would extend into the Sage-Cielo Vista property. Therefore, three lots at this point in time do not conform with OCFA's FMZ standard.

Alternative fuel modification zones are proposed for the three affected lots. In order to retain the lots, which are important for the financial viability of the project, the project's Alternative Materials and Methods letter incorporates a layered, redundant system including a combination of permanently irrigated, fire-resistant landscaping which provides for a minimum of 20 feet of Zone A along with a total of approximately 157 feet (Lot 7), 140 feet (Lot 8), and 150 feet (Lot 9) of FMZ. Options 2 and 2A includes similar achievable FMZs, but for lots 8, 9, and 10. This enables each lot to include a back yard area outside the FMZ, starting at the structure and extending across the flat pad to the Zone A and a heat-deflecting landscape wall at the top of slope. A series of retaining walls provide up to 42 feet of vertical separation from the off-site, native fuels below (Figures 13, 14, and 15). In addition, the structures on these lots will include the addition of dual-pane, both panes tempered windows, focused homeowner education, and annually inspected FMZs. These measures are anticipated to provide at least an equivalent level of protection to OCFA's standard requirements for fuel modification zones.

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FIGURE 10

Option 1 - Lots With Off-Site Fuel Modification Zones

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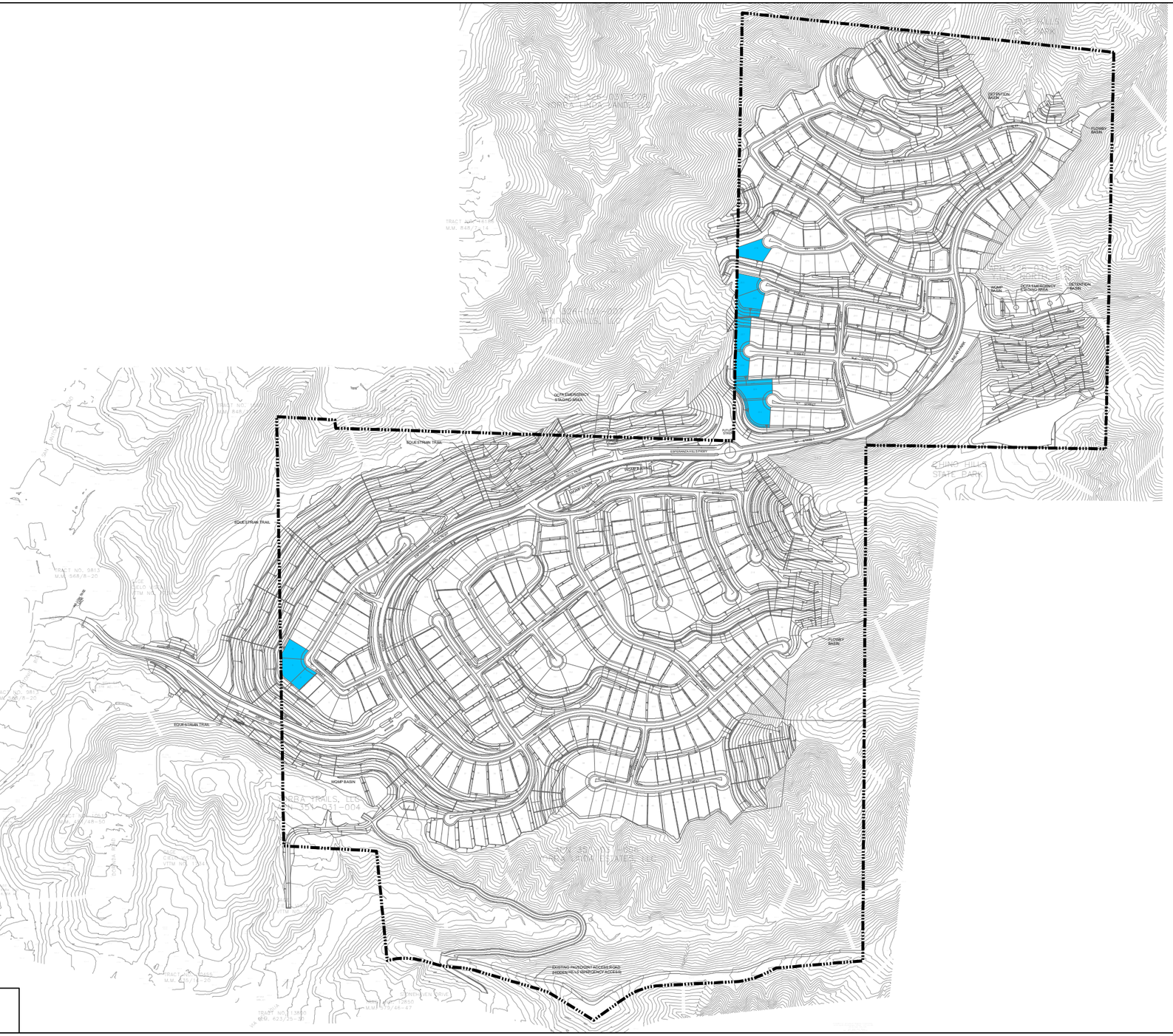

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FIGURE 11

Option 2 - Lots With Off-Site Fuel Modification Zones

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FIGURE 12

Option 2A - Lots With Off-Site Fuel Modification Zones

ESPERANZA HILLS FIRE PROTECTION AND EMERGENCY EVACUATION PLAN

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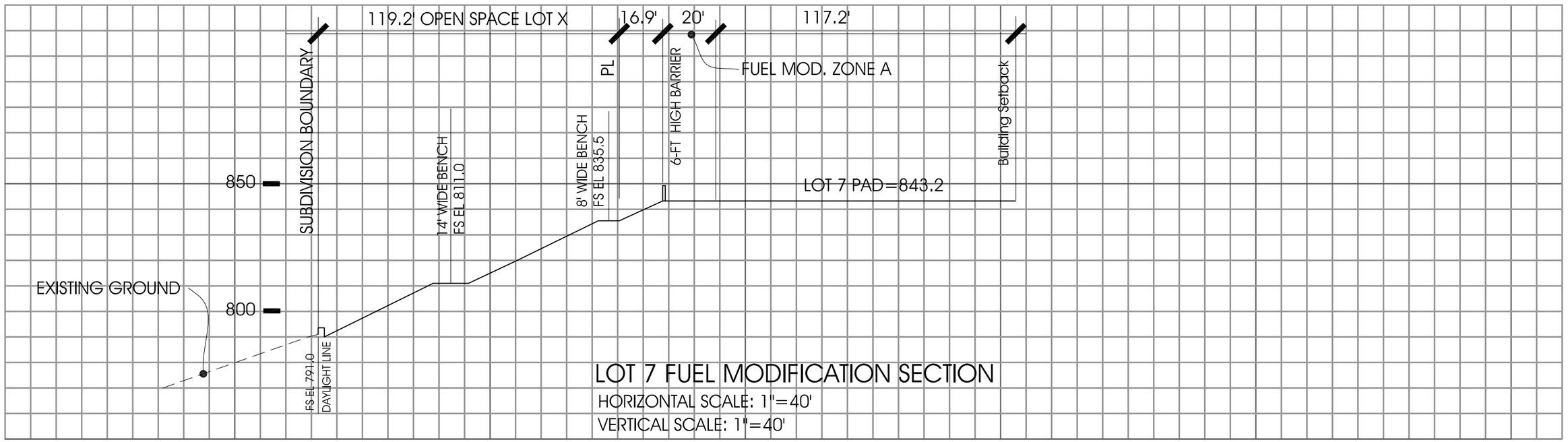

LOT 7 FUEL MODIFICATION SECTION

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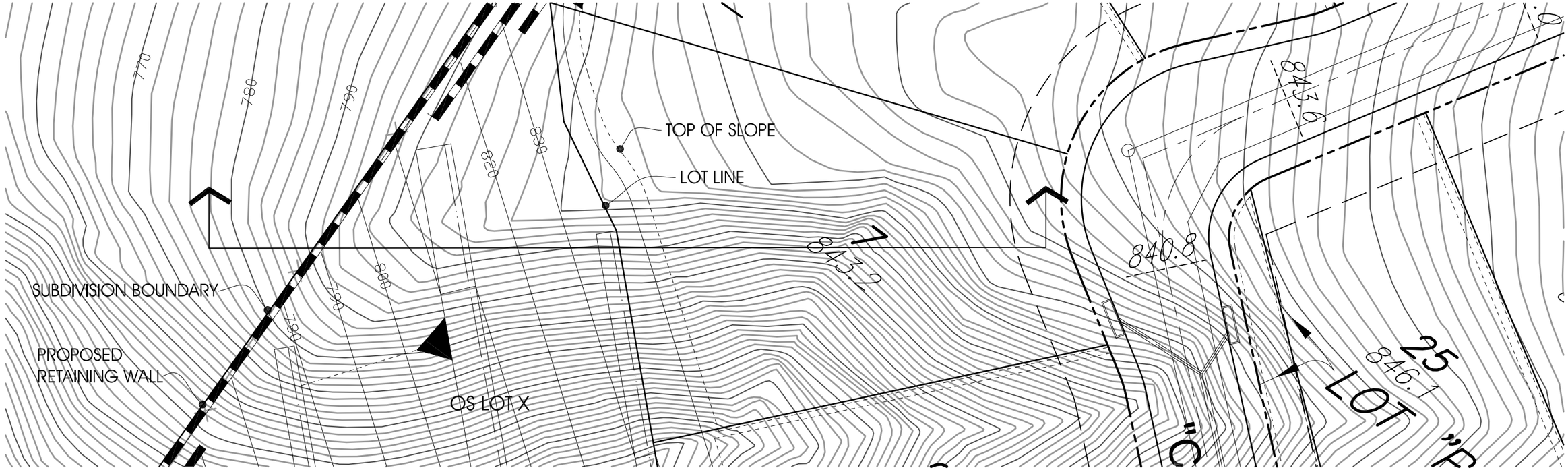
VERTICAL SCALE: 1"=40'



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SCALE IN FEET

FIGURE 13
Esperanza Hills Lot 7 - Fuel Modification Section

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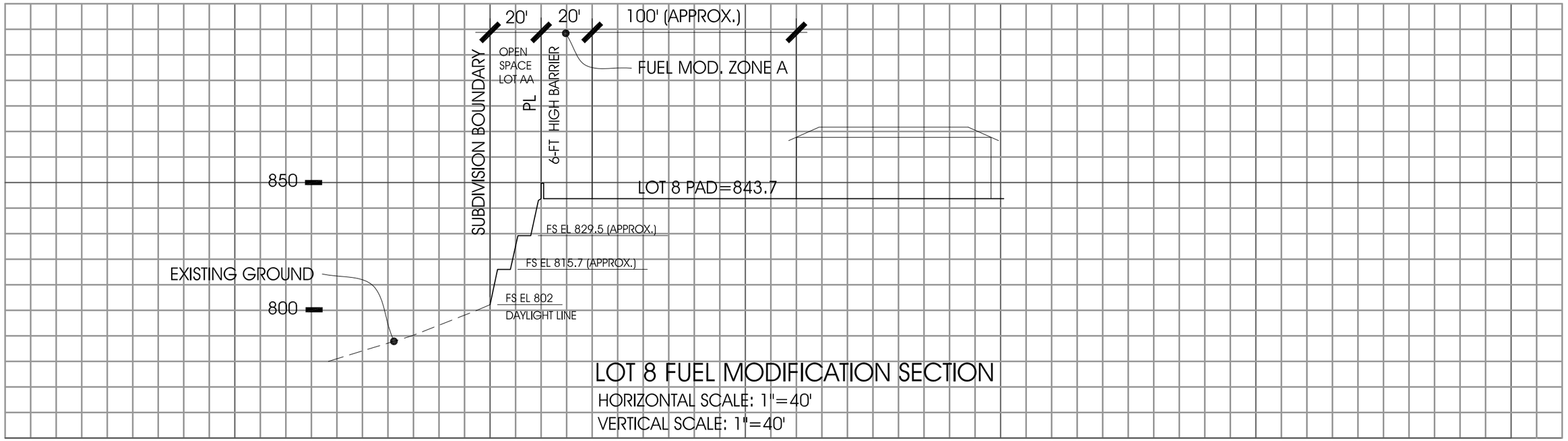

LOT 8 FUEL MODIFICATION SECTION

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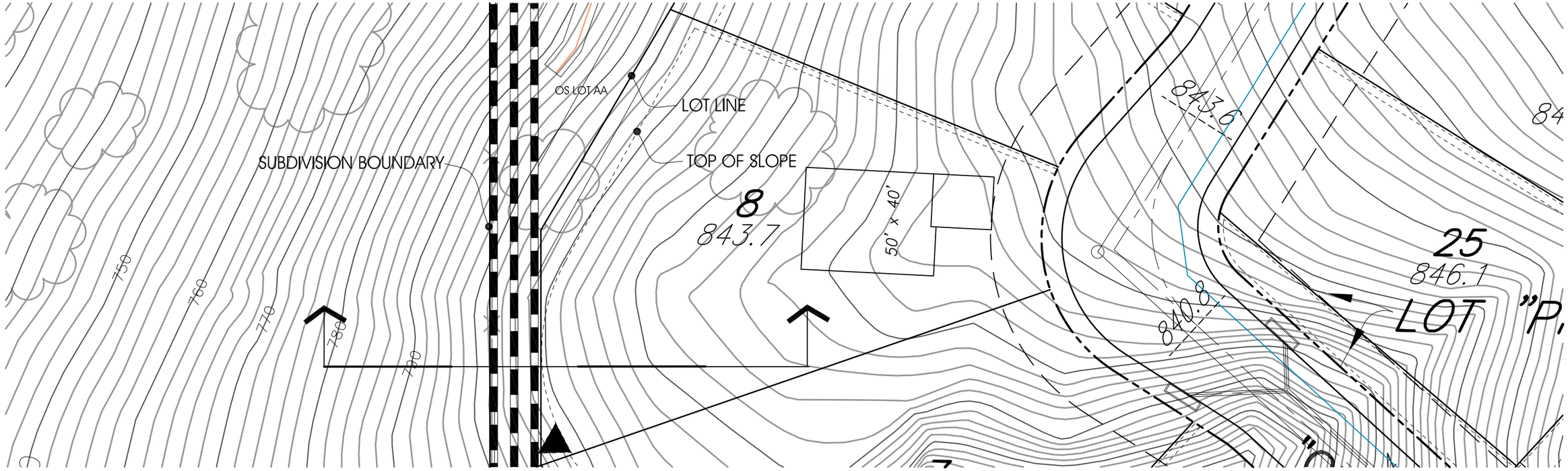
VERTICAL SCALE: 1"=40'



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SCALE IN FEET

FIGURE 14
Esperanza Hills Lot 8 - Fuel Modification Section

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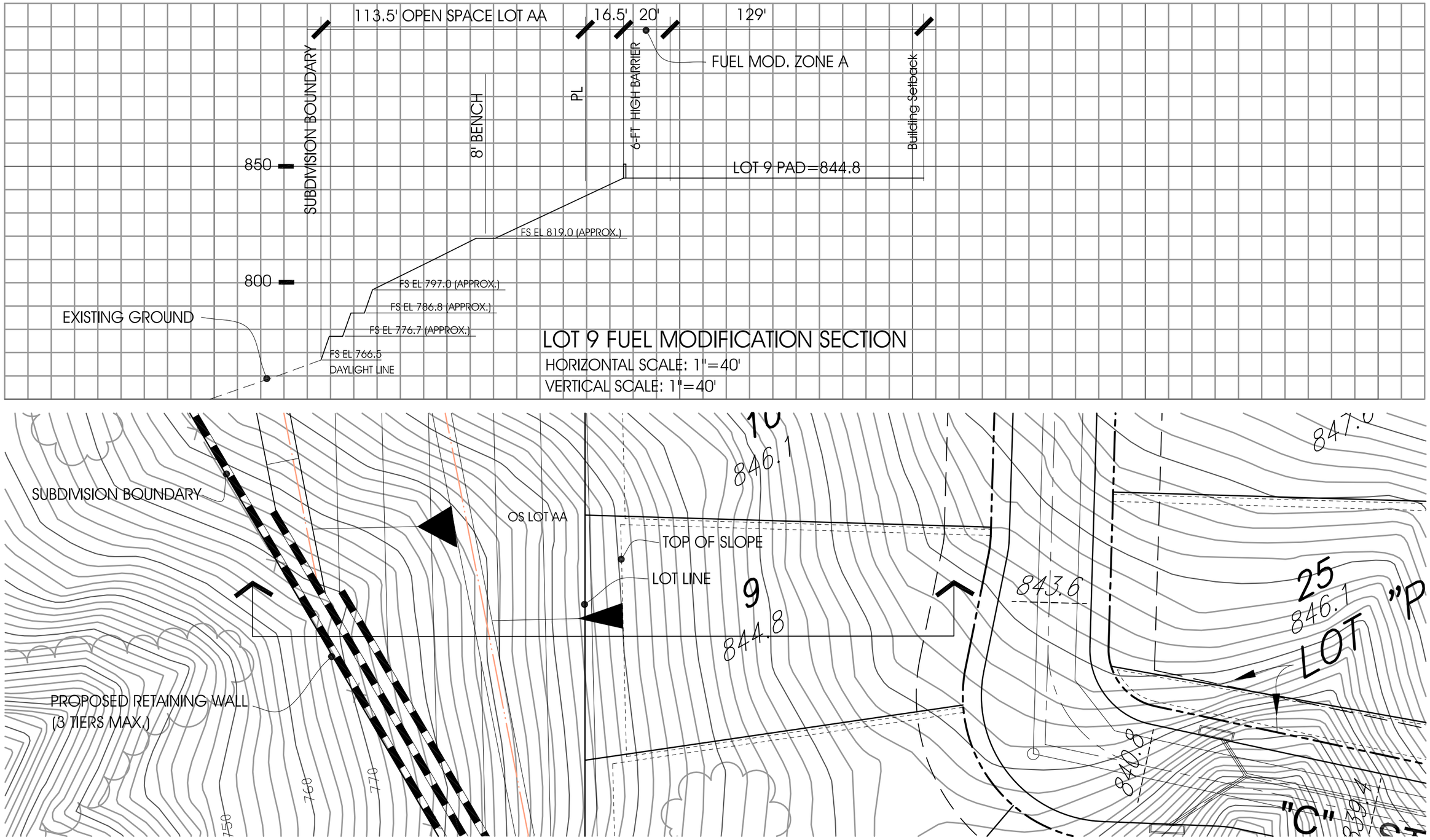

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SCALE IN FEET

FIGURE 15

Esperanza Hills Lot 9 - Fuel Modification Section

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3.2 Structural and Infrastructural Requirements

The Esperanza Hills Community structural and infrastructural fire protection components will comply with the 2010 California Building Code and 2010 Fire Code, as adopted by OCFA or the latest codes in place at the time of construction. The specific requirements are not repeated herein in order to minimize repetitiveness and potential inaccuracies, however, key features are summarized in the following sections. It is important to note that ignition resistant features required by code are extremely important for minimizing structure loss in wildfire events. No homes built to at least the 1996 Yorba Linda ignition resistant construction standards were lost in the Freeway Complex Fire (OCFA 2008), and the 1996 requirements are far less stringent and resistive to fire and embers than the current code.

The following features are designed to reduce ember penetration:

1. Interior sprinklers are required for all new structures and include provisions for a residential NFPA 13-D system. Esperanza Hills will exceed this requirement by providing attic heads (a variation on the 13-D system), which provide a layered contingency feature should embers penetrate the ember-resistant vents.
2. Exterior walls of all structures will be approved noncombustible (stucco, masonry, or approved cement fiber board) or ignition-resistant material (heavy timber) from grade to underside of roof system, per the Building Code. Wood shingle and shake wall covering is prohibited. Any unenclosed under-floor areas will have the same protection as exterior walls. Wall coverings will extend from top of foundation to the roof. The underside of any cantilevered or overhanging appendages and floor projections will maintain the ignition-resistant integrity of exterior walls, or projection will be enclosed to grade (704A.3.1 CBC).
3. Two-inch nominal solid blocking will be provided between rafters at all roof overhangs under exterior wall covering (Section 704A.3.1.1 CBC).
4. If eaves are installed, eaves and soffits will meet requirements of the State Fire Marshal 12-7A-3 or will be protected by ignition resistant materials or noncombustible construction on the underside (Section 704A.2.3 CBC).
5. All roofs will be a Class "A" listed and fire-rated roof assembly, installed per manufacturer's instructions, to approval of the OCFA. Any openings on ends of roof tiles will be enclosed to prevent intrusion of burning debris. When provided, roof valley flashings will not be less than 0.019-inch (No. 26 galvanized sheet gage) corrosion-resistant metal installed over a minimum 36-inch-wide underlayment consisting of one layer of No. 72 American Society for Testing and Materials cap sheet running the full length of the valley (Section 704A.1 CBC).

6. No attic ventilation openings or ventilation louvers will be permitted in soffits, rakes, eaves, cornices, eave overhangs, or between rafters at eaves, or in other overhanging areas in the WUI area. Attic or foundation ventilation openings or ventilation openings in vertical walls or other similar ventilated openings will be louvered and covered with corrosion-resistant metal screening or other approved material that offers equivalent protection. Vents are required to have a minimum 0.125 inch and a maximum 0.25-inch mesh and will not exceed 144 square inches each. Attic and foundation ventilation will also comply with the requirements of the CBC. It is recommended that Flame and Ember resistant vents with internal baffles are applied to all wildland exposed sides of these residences.
7. Vents will not be placed on roofs unless they are approved for Class "A" roof assemblies or are otherwise approved by the OCFA. Vents, such as roof vents, dormer vents, gable vents, foundation vent openings, vent openings in walls, or other similar vent openings, will be covered with louvers and the required 0.125–0.25-inch mesh or are specific flame and ember resistant (i.e., O'Hagen, Brandguard Vents).
8. Turbine vents are restricted.
9. Glazing, including glass, or other transparent, translucent, or opaque glazing, or leaded glass, will be one of the following: double pane with one tempered pane or glass block, or have a fire rating of 20 minutes (Section 704A.3.2.2). Plastic or vinyl window frames will be of an approved type, which will not melt, ignite, or fail. Vinyl frames will have welded corners and metal reinforcement in the interlock area to maintain integrity.
10. Skylights will be certified to Architectural Manufacturers Association/Window and Door Manufacturers Association/Canadian Standards Association 101/I.S-2/A440 structural requirements. (Section 2405.5 CBC).
11. Rain gutters and downspouts will be noncombustible and designed to prevent the accumulation of leaf litter or debris (Section 704A.1.5 CBC).
12. Exterior doors will be approved noncombustible or 1.25-inch solid-core wood or have a 20-minute fire rating. Windows within doors and glazed doors will comply with item 11 above (Section 7904A.3.2.3 CBC).
13. Exterior balconies, carports, decks, patio covers, unenclosed roofs and floors, and similar architectural appendages (including gazebos, palapas, and large play structures) and projections will be of approved noncombustible construction, approved fire-retardant wood, heavy timber (4-by-4-inch minimum with 6-by-6-inch posts) or 1-hour fire-resistive construction. When such appendages and projections are attached to exterior fire-resistive walls, they will be constructed to maintain the fire-resistive integrity of the exterior wall and will have the same fire rating (Section 704A.4 CBC).

a. Any decks or overhangs over slopes will be enclosed and are subject to the approval of the OCFA. Decks will be constructed to the same ignition-resistive standards as the primary structure.

b. There will be no combustible awnings, canopies, or similar combustible overhangs (excluding heavy timber construction).

14. No wood fences will be allowed (excluding heavy timber construction, per OCFA direction).

15. All chimneys and other vents on heating appliances using solid or liquid fuel, including outdoor fireplaces and permanent barbeques and grills, will have spark arrestors of a type approved by the OCFA. Spark arrestor openings will be a maximum 0.5 inch.

16. Storage sheds, barns, and outbuildings will be of approved noncombustible construction (including heavy timber) with noncombustible Class A roofs that do not increase the risk of ignition to the primary structures. Locations and required FMZs will be subject to approval of OCFA and the Building Official based on the size of the structure.

3.3 Road Requirements

3.3.1 Access

Access Roads

Site access will comply with the requirements of the Orange County Fire Code. The project's fire master plan provides additional details on proposed roads.

Road Widths and Circulation

1. Roads designated Fire Lanes (fire apparatus access roads) will be constructed to minimum 28-foot travel widths, including 28 feet wide with parking on one side, or 36 feet wide with parking on both sides.
2. Roads designated Fire Lanes will be improved with aggregate cement, asphalt paving materials, or other approved all-weather surfacing material. All interior residential streets will be designed to accommodate a minimum of a 68,000-pound fire apparatus.
3. Firefighting staging areas are provided throughout the community as any roadway, cul-de-sac, or park can be utilized by OCFA during fire emergencies. In addition, OCFA selected locations throughout the community where they could position engines and personnel in advance of a wildfire. During wildfire events, entire strike teams or smaller numbers of engines and personnel will be able to stage equipment and conduct pre-suppression and suppression activities from these cleared, flat areas. The staging area

locations are illustrated in Appendices C and D and include in Blue Mud Canyon and in the northwest and northeast portions of the community.

4. Inside turning radii will be a minimum 17 feet and outside turning radii shall be a minimum 38 feet. Where possible, a minimum 20 feet inside and 42 feet outside radii will be provided to accommodate the largest of OCFA's apparatus.
5. Emergency secondary access is provided for this project under all three project options (Options 1, 2, and 2A). Under Option 1, primary access is provided off of existing Stonehaven Drive. Emergency secondary access is provided off of "C" Street and at the terminus of "A" Street (within the Esperanza Hills Community) to a roadway that connects to the south with Via Del Agua. Internally, the neighborhoods include looped roadways providing at least two entrances. Under Option 2, primary access is obtained off of Aspen Way to the west. Emergency secondary access is provided to the south via "C" Street, "A" Street as well as via the road leading to Stonehaven Drive (Option 1 primary access) in an improved condition, but not to fire apparatus access road standards. Option 2A is identical to Option 2 except that primary access is gained from a newly constructed road roughly 1,280 feet south of Aspen Way that connects directly to San Antonio Road. Emergency secondary access is the same as Option 2.
6. Any dead end roads designated as Fire Lanes that are longer than 300 feet will have approved provisions for fire apparatus turnaround.
7. Minimum radius for cul-de-sacs is 38 feet and minimum diameter is 72 feet. They shall be posted "No Parking; Fire Lane."
8. Roadways and/or driveways will provide fire department access to within 300 feet of all portions of the exterior walls of the first floor of each structure, based on all structures being provided automatic fire sprinklers.
9. Vertical clearance of vegetation along roadways will be 13 feet 6 inches. Vertical clearance in the retail/commercial areas may be more restrictive to allow aerial ladder truck operation.
10. Angle of driveway/roadway approach/departure will not exceed 7° (12%) unless approved by the Fire Chief.
11. Developer will provide electronic roads information, in a standard digital format acceptable to OCFA, for updating Response maps.
12. Road grades will not exceed 15% (8.5 degrees), based on all structures including automatic fire sprinkler systems. Cross slope shall not exceed 2% for paved access ways.
13. Any roads that have traffic lights will also have Fire District–approved traffic preemption devices (Opticom) compatible with devices on the Fire Apparatus.

3.3.2 Gates

Access gates will comply with the Fire Code. Public roads will not be gated, per the Fire Code. Any gates on any private roads or on private driveways will be as follows, complying with OCFA standards for electric gates.

1. Access gates will be equipped with a KNOX key switch, which overrides all command functions and opens the gate. Gates serving more than 1 parcel will be equipped with sensors for detecting emergency vehicle "Opticom" strobe lights from any direction of approach. Strobe detection and key switches will be provided on the interior and exterior of gates.
2. Switches will be dual keyed, or two switches provided, for Fire and Law Enforcement.
3. Gate activation devices will be equipped with a battery backup or manual mechanical disconnect in case of power failure.

3.3.3 Driveways

All structures will be provided automatic interior fire sprinklers and no structure will be located 300 feet or more from a Fire Lane road in the development.

3.3.4 Water Capacity/Availability

The water supply for fire protection will be a looped public water system provided by the Yorba Linda Water District and will be designed and installed to their standards. The project will construct two underground water reservoirs that will provide gravity flow to on-site hydrants for firefighting. In addition, adequate on- and off-site redundant water supply would be provided for residential and emergency use. The addition of a gravity fed water supply will directly address potential issues with firefighting throughout portions of the eastern wildland urban interface areas of Yorba Linda. A major issue during the Freeway Complex Fire was loss of water supply in critical hydrants that are supplied water via booster pump. The Yorba Linda Water District includes water supply for some areas that are not gravity fed, relying on booster pumps to provide pressure to deliver water at the hydrants and consumers. The booster pump(s) and back-up generator failed during the Freeway Complex Fire, resulting in no water at the hydrants. This situation was determined in court to have contributed to the loss of several structures in the area. The Esperanza Hills Project provides two reservoirs that will not rely on pumps and will alleviate this issue.

The system proposed for the Esperanza Hills Community would include pump stations that feed the reservoirs which would provide a large supply of water storage that is reliably available during wildfire events. The system incorporates the following features:

- Two pump stations, one for each pressure zone
- Two water storage tanks (size to be determined)
- Pressure reducing station
- Pipelines in the project
- Off-site improvements to pump station, well capacity, and pipeline upgrades (to be determined)

Fire Hydrants and Interior Sprinklers

1. Hydrant type and locations will be subject to OCFA approval and will be located on the normal Fire Apparatus response side of the road.
2. All on-site fire hydrants will flow at 20 psi.
3. All structures within this project are required to be fitted with automatic fire sprinklers. This project will exceed that requirement by including attic coverage. Attic heads provide a back-up protection to the ember resistant vents that will be provided each structure. As such, fire flow for residences will provide a minimum 1,000 gallons per minute for a duration of one hour, per CFC Table B105.1 "Minimum Required Fire Flow and Flow Duration for Buildings," as adopted by the OCFA.
4. Spacing distance between on-site hydrants will be 500 feet in residential areas.
5. Prior to the issuance of building permits, the applicant will submit to the County plans demonstrating a water system capable of handling the fire flow requirements—existing and proposed buildings.
6. Prior to issuance of building permits, the appropriate number of fire hydrants and their specific locations, approved by the OCFA Fire Marshal, will be identified and they will be constructed accordingly.

4.0 EMERGENCY PRE-PLANNING

The following sections address emergency planning for the Esperanza Hills Community. The focus of these sections includes summarizing the recommended evacuation and relocation protocols, describing expected population reactions during emergency evacuations, and recommended preparedness and on-going training.

4.1 Esperanza Hills Emergency Response Procedures

A Community Evacuation Plan (CEP) will be prepared for the Esperanza Hills Community prior to occupancy. The CEP will utilize existing information from Orange County Office of Emergency Services and a standard template, [such as described on the San Diego County Office of Emergency Services (OES) Web site (http://www.sdcounty.ca.gov/oes/)]. Fire and law enforcement authorities must participate in preparation/review of the CEP and it will be integrated and coordinated with the City of Yorba Linda Community Evacuation Plan when it is completed (initial plans to prepare the community evacuation plan in 2009; no plan was available at the time of this FPEP preparation). Likewise, the City of Yorba Linda's evacuation plan and County evacuation plans will need to be updated to recognize the Esperanza Hills community and its positive effect on evacuation planning. Because the project will convert large areas of wildland fuels to managed landscapes and create a wildfire buffer between preserved open space and older, more vulnerable neighborhoods, there may be a change in the need to evacuate large blocks of these older areas of Yorba Linda. It is reasonable to conclude that during wildfires occurring during typical weather patterns (non-extreme conditions) and for fires that occur with reduced timeframes for evacuation may enable a less aggressive evacuation approach, freeing up roadways for those areas being directly threatened. However, this FPEP emphasizes early evacuation and "Ready, Set, Go!" principles for residents within roughly a 2 to 3 mile range of wildland fuels during extreme weather conditions, as wildfire embers have been the primary cause of structure fires and loss.

The CEP provides site specific procedures for various emergency situations, including wildfire, and once complete, will be made available to Esperanza Hills residents. The CEP will be reviewed by residents at least annually through organized meetings and educational outreach by the HOA.

The CEP will form the backbone of hazard relocation/evacuation planning for the Esperanza Hills community. Wildfire emergencies will be one component of the CEP. Among the important concepts that will be included in the CEP are hazard identification, a description of the area's environment, mitigation strategies, law enforcement, fire agencies and contact information, homeowner education materials, preparedness checklist, route planning, and specific procedures for early evacuation and contingency on-site refuge.

This FPEP provides considerable information that can be integrated into the CEP. Climate, vegetation, topography, wildfire hazards, fire agencies, and other descriptive information in this FPEP can be utilized in the CEP. Additionally, this FPEP outlines important relocation considerations that will be integrated into the CEP, as described in the following sections.

Further, the CEP will include provisions for:

- Pre-fire planning and preparations
- Post-fire recovery actions
- Communications/registering with Alert OC (Orange County's Reverse 911 system)
- Prevention (maintenance of fuels around buildings, gutter and roof clearance, vent protection)
- Emergency contact numbers
- Annual Evacuation Training Schedule
- Fire Prevention Measures during High Fire Danger and Red Flag Warning periods
- Annual Review and Update Requirements
- Wildfire Emergency Evacuation Plan Details
- On-site partial Relocation vs. Off-site Evacuation

The updated CEP document should be reviewed and accepted by OCFA.

Wildfire emergency response procedures will vary depending on the type of wildfire and the available time in which decision makers from the fire authority and law enforcement can assess the situation and determine the correct evacuation alternative. The Esperanza Hills Community's potential alternatives during evacuation will be shared with emergency planning officials so that all options can be considered during a wildfire emergency. The following sections discuss emergency evacuation options available for the Esperanza Hills Community.

4.2 Evacuation Approach

As identified in this FPEP, in case of wildfire, the preferred plan is early evacuation following the principles of "Ready, Set, Go". This concept was developed by FIRESCOPE (**FI**refighting **RE**sources of **S**outhern **C**alifornia **O**rganized for **P**otential **E**mergencies"). The Ready, Set, Go! Program was designed for citizens in fire prone areas and centers on preparation and early evacuation. The concept includes attention on being "Ready" for wildfire by pre-planning, being "Set" through ongoing preparedness training, and implementing the "Go" by implementing evacuations well-before the community is directly threatened.

As detailed in this FPEP, The Esperanza Hills site and its structures will be designed and constructed to withstand significant wildfire. Nevertheless, the community will be provided an evacuation "road map" to be implemented by the HOA and based on a conservative approach. Figures 16, 17 and 18 provide initial Emergency Ingress/Egress Plans for Options 1, 2, and 2A of the Esperanza Hills project, respectively. These plans will be incorporated into the CEP. As indicated in multiple fires over the last decade throughout southern California, early notification and evacuation of residents is an effective means of avoiding or limiting loss of life. The status of evacuation decision making, i.e., trigger thresholds, methods, and management has been fine-tuned over the last decade from real-world implementation and evaluation of successes and failures. It is reasonable to assume, based on past examples, that the wildfire evacuation triggers in Orange County during a wildfire are conservative in nature and would typically enable evacuation of threatened areas well before a fire encroaches. However, this FPEP provides a contingency plan for the rare event that there is not enough time for an off-site evacuation. This Contingency plan is discussed in greater detail in the following sections.

4.3 Esperanza Hills Evacuation Plan

In all cases, early relocation from the site to off-site areas via a conservative trigger threshold is the primary and preferred response that will be implemented, whenever possible, as determined by the local fire authority and/or law enforcement and County OES. Evacuation of very large numbers of people can be accomplished successfully via a coordinated effort including a mass notification system (such as Alert OC and Reverse 9-1-1), coordinated community notification, a conservative trigger threshold for initiating the relocations, and on-the ground enforcement/guidance (e.g., 2003 and 2007 San Diego Fire Storms). In the same manner, when conditions are such that distant wildfire may move toward the Esperanza Hills Community, resident evacuation will occur, allowing for several hours to as much as a day or more notice.

The local fire authority will conservatively initiate relocation of the Esperanza Hills Community based on weather conditions, location of fire, and regional traffic conditions. Any wildfire within the vicinity of the community will trigger a consideration for whether full or partial evacuation is necessary. Wildfires are most likely to approach the Project site from the north/northeast/east, where wildland fuels are present. Areas to the west/northwest/southwest are predominantly urban Yorba Linda.

Decisions regarding wildfire behavior and the corresponding time available before fire threatens the community will be made by fire officials involved in the Incident Command System which is established for all significant wildland fires and may include OCFA, CalFire, OES, and/or other fire or law officials. Road closures and traffic control will be among the tasks performed by law enforcement.

4.3.1 Partial Community Evacuation

Evacuation of residents would typically occur during large wildfire events that, due to weather patterns and difficulty in gaining control, could threaten the community, but are distant enough that evacuation from the Project area is possible. For example, the 2008 Freeway Complex Fire, which occurred during extreme weather conditions (Red Flag Weather with 8% humidity, and 43 to 50 mph winds) took over three hours to reach the easterly boundary of the Esperanza Hills property. This type of fire behavior history and modeling information will be used by the Incident Command for aiding evacuation declarations. Law enforcement and fire officials involved with the Incident Command System set up for a wildfire would evaluate the wildfire event and determine at which point relocation of various potentially affected areas would occur and whether it would be a partial or community wide evacuation. Allowances for adequate time will be a key factor in determining the evacuation timeframe so that the roads do not become congested. Fire fighter access will be a key priority and the array of dedicated fire apparatus access roads in the project (identified in Figures 16, 17, and 18) will provide ingress in the event of a wildfire.

If community-wide evacuation from the Project site is not necessary due to the nature (type, size, or location) of a wildfire and corresponding weather conditions or is not possible due to dangerous conditions on area roads that would be used for relocating and may effect residents from older, more vulnerable communities' evacuation, a partial evacuation may be enacted. According to a partial evacuation scenario, priority residents (described below) will be instructed to temporarily relocate out of the community or to a neighbor's home in the interior of the community. Other residents may be directed to remain in their homes.

Since evacuation of the community, at maximum usage, may require in excess of 1.5 hours, a conservative trigger threshold is required in order to fully evacuate the community to off-site areas. A fast moving fire ignited along the 91 Freeway, as it did in the 2008 Freeway Complex Fire took over three hours to reach the project area. This information has been considered when determining evacuation trigger thresholds. However, there may be circumstances where less than 1.5–2 hours are available and a partial evacuation will occur. Partial evacuations would be based on priority addresses, starting with the addresses on the periphery (WUI exposures) of each Esperanza Hills neighborhood (Appendix F) These residences interface with the wildland areas and may be more exposed to wildfire affects than interior community structures, as was indicated by post-fire research conducted by the Institute for Business and Home Safety (2008). In such cases, potentially affected residents would be instructed to relocate where they will be temporarily accommodated until the wildfire threat has passed. The Esperanza Hills Community, following implementation of the requirements in this FPEP, will have the protective action of on-site refuge as a last resort in an emergency wildfire situation.

ESPERANZA HILLS
STUDY #22 - STONEHAVEN OPTION 1
EMERGENCY INGRESS/EGRESS PLAN

YORBA LINDA LAND, LLC

YORBA LINDA ESTATES

BRIDAL HILLS, LLC

YORBA TRAILS, LLC

CIELO VISTA

YORBA LINDA ESTATES

TANK SITE PAD=1396.0 1390 HWL

ESTATE LOT 2 PAD=1336.0

DETENTION BASIN

FLOWBY BASIN

PARK PAD=1240.0

PARK PAD=1234.0

PARK PAD=1200.0

WQMP BASIN

OCFA EMERGENCY STAGING AREA

DETENTION BASIN

LINEAR PARK

PARK

ESTATE LOT 1 PAD=1340.0

EQUESTRIAN TRAIL

OCFA EMERGENCY STAGING AREA

WQMP BASIN

1200 ZONE BOOSTER PS PAD=1020.0

TANK SITE PAD=1205.0 1200 HWL

PARK

PARK

FLOWBY BASIN

MONUMENT PAD=820.0

WQMP BASIN

1200 ZONE BOOSTER PS PAD=790.0

PARK

OCFA EMERGENCY STAGING AREA

PROPOSED 75' SPAN PRE-FAB BRIDGE

BLUE MUD CANYON

BLUE MUD CANYON

EXISTING PAVED/DIRT ACCESS ROAD (HIDDEN HILLS EMERGENCY ACCESS)

EXISTING HIDDEN HILLS EMERGENCY EGRESS

STONEHAVEN DRIVE

VIA DEL AGUA

SAN ANTONIO ROAD

ASPEN WAY

SAN ANTONIO ROAD

DORINDA ROAD

200 0 200 400 600
SCALE IN FEET

TYPICAL STREET SECTIONS — SCALE: 1" = 10'-0"

90' R.O.W.-
14' RAISED MEDIAN
26' CURB TO CURB
26' CURB TO CURB
66' CURB TO CURB
90' R.O.W.

52' R.O.W.-
36' CURB TO CURB
52' R.O.W.

44' R.O.W.-
30' CURB TO CURB
44' R.O.W.

28' ACCESS-
28' ACCESS ROAD

20' ACCESS-
20' ACCESS ROAD

15' ACCESS-
15' ACCESS ROAD

NOTE: ALL CUL-DE-SACS ARE TO HAVE A MINIMUM OF A 38'-0" TURNING RADIUS

ROUTE/ ACCESS LEGEND

- EMERGENCY INGRESS/EGRESS CIRCULATION
- RESIDENTIAL EVACUATION ROUTE
- FIRE DEPARTMENT ACCESS POINT
- FIRE HYDRANT WITH DIRECT CONNECTION TO WATER TANK

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ESPERANZA HILLS
STUDY #21 - ASPEN WAY OPTION 2
EMERGENCY INGRESS/EGRESS PLAN

YORBA LINDA LAND, LLC

YORBA LINDA ESTATES

BRIDAL HILLS, LLC

YORBA TRAILS, LLC

CIELO VISTA

YORBA LINDA ESTATES

TANK SITE PAD=1356.0 1390 HWL

ESTATE LOT 2 PAD=1336.0

DETENTION BASIN

FLOWBY BASIN

PARK PAD=1240.0

PARK PAD=1234.0

PARK PAD=1200.0

WQMP BASIN

OCFA EMERGENCY STAGING AREA

DETENTION BASIN

LINEAR PARK

PARK

ESTATE LOT 1 PAD=1340.0

OCFA EMERGENCY STAGING AREA

EQUESTRIAN TRAIL

1390 ZONE BOOSTER PS PAD=1020.0

WQMP BASIN

TANK SITE PAD=1205.0 1200 HWL

EQUESTRIAN TRAIL

PARK

PARK

FLOWBY BASIN

SAN ANTONIO ROAD

ASPEN WAY

SAN ANTONIO ROAD

EQUESTRIAN TRAIL

MONUMENT PAD=820.0

WQMP BASIN

1200 ZONE BOOSTER PS PAD=765.0

PARK

DORINDA ROAD

OCFA EMERGENCY STAGING AREA

EXISTING PAVED/DIRT ACCESS ROAD (HIDDEN HILLS EMERGENCY ACCESS)

EXISTING HIDDEN HILLS EMERGENCY EGRESS

STONEHAVEN DRIVE

VIA DEL AGUA

200 0 200 400 600
SCALE IN FEET

TYPICAL STREET SECTIONS — SCALE: 1" = 10'-0"

90' R.O.W.-
14' RAISED MEDIAN
26' CURB TO CURB
26' CURB TO CURB
66' CURB TO CURB
90' R.O.W.

52' R.O.W.-
36' CURB TO CURB
52' R.O.W.

44' R.O.W.-
30' CURB TO CURB
44' R.O.W.

28' ACCESS-
28' ACCESS ROAD

20' ACCESS-
20' ACCESS ROAD

15' ACCESS-
15' ACCESS ROAD

NOTE: ALL CUL-DE-SACS ARE TO HAVE A MINIMUM OF A 38'-0" TURNING RADIUS

ROUTE/ ACCESS LEGEND

- EMERGENCY INGRESS/EGRESS CIRCULATION
- RESIDENTIAL EVACUATION ROUTE
- FIRE DEPARTMENT ACCESS POINT
- FIRE HYDRANT WITH DIRECT CONNECTION TO WATER TANK

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ESPERANZA HILLS
STUDY #23 - SAN ANTONIO OPTION 2A
EMERGENCY INGRESS/EGRESS PLAN

YORBA LINDA LAND, LLC

YORBA LINDA ESTATES

BRIDAL HILLS, LLC

YORBA TRAILS, LLC

CIELO VISTA

YORBA LINDA ESTATES

SAN ANTONIO ROAD

ASPEN WAY

DORINDA ROAD

VIA DEL AGUA

STONEHAVEN DRIVE

FLOWBY BASIN

WQMP BASIN

OCFA EMERGENCY STAGING AREA

DETENTION BASIN

LINEAR PARK

EQUESTRIAN TRAIL

MULTI-USE TRAIL

MONUMENT SIGN (TYP.)

EXISTING PAVED/DIRT ACCESS ROAD (HIDDEN HILLS EMERGENCY ACCESS)

EXISTING HIDDEN HILLS EMERGENCY EGRESS

200 0 200 400 600
SCALE IN FEET

TYPICAL STREET SECTIONS — SCALE: 1" = 10'-0"

90' R.O.W.-
14' RAISED MEDIAN
26' CURB TO CURB
26' CURB TO CURB
66' CURB TO CURB
90' R.O.W.

52' R.O.W.-
36' CURB TO CURB
52' R.O.W.

44' R.O.W.-
30' CURB TO CURB
44' R.O.W.

28' ACCESS-
28' ACCESS ROAD

20' ACCESS-
20' ACCESS ROAD

15' ACCESS-
15' ACCESS ROAD

NOTE: ALL CUL-DE-SACS ARE TO HAVE A MINIMUM OF A 38'-0" TURNING RADIUS

ROUTE/ ACCESS LEGEND

- EMERGENCY INGRESS/EGRESS CIRCULATION
- RESIDENTIAL EVACUATION ROUTE
- FIRE DEPARTMENT ACCESS POINT
- FIRE HYDRANT WITH DIRECT CONNECTION TO WATER TANK

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4.3.2 Social Aspects of Wildfire Evacuation

Wildfires in Orange County automatically result in an analysis of evacuations. The initial response team may request evacuations and for fires burning under conditions that make containment difficult, an Incident Command is engaged and larger scale evacuations are analyzed. The current and predicted fire behavior and spread is at the heart of evacuation considerations, driving the determination at which point evacuations throughout the wildland urban interface areas would occur and utilizing conservative thresholds. Allowance for adequate relocation time is a key factor in determining the relocation timeframe so that the roads do not become congested. It is estimated that orderly evacuation of Esperanza Hills community, at maximum capacity (roughly 1,000 persons) may require up to 90 minutes or more. Resident receptiveness to evacuation information and their ability to process and carry out given direction, plays a large role in the successful movement of a large number of people in multiple vehicles from one area to another.

Typically, an organized population, like would be found in an HOA governed community (assuming the HOA is strong and active) has a population that more readily accepts instruction regarding safety rules, including fire and evacuation requirements. Wildfire emergency response procedures will vary depending on the type of wildfire and the available time in which decision makers (Incident Command, OCFA, CAL FIRE, and/or County Office of Emergency Management) can assess the situation and determine the best course of action.

There are two types of evacuation envisioned for Esperanza Hills. The first is an orderly, pre-planned evacuation process where people are evacuated from the area to off-site areas further from the encroaching wildfire (likely in urban areas of Yorba Linda and surrounding communities) well before fire threatens the site. The second type of evacuation is a last-resort, contingency plan only used in the rare occasion when evacuation from the site is considered more dangerous than temporarily seeking shelter in the site's ignition resistant structures.

Orderly movement of people is the result of planning, training, education, and awareness, all of which will be proactively implemented at Esperanza Hills. Evacuation has been the standard term used for emergencies and implies imminent or threatening danger. The term in this FPEP, and under the "Ready, Set, Go!" concept, indicates that there is a perceived threat to residents and visitors and movement out of the area is necessary, but will occur according to a pre-planned protocol, reducing the potential for panic. Visitor reactions may vary during an evacuation event, although several studies indicate that orderly movement during wildfire and other emergencies is not typically unmanageable. Social science research literature indicates that reactions to warnings follow certain behavior patterns that are defined by people's perceptions (Aguirre 1994, Drabek 1991, Fitzpatrick and Mileti 1994, Gordon 2006, Collins 2004) and are not

unpredictable. In summary, warnings received from credible sources by people who are aware (or have been made aware) of the potential risk, have the effect of an orderly decision process that typically results in successful evacuation. This success is heightened when evacuations are practiced (Quarentelli & Dynes 1977; Lindell & Perry 2004) as will be performed at the Esperanza Hills Community. Further, it would be anticipated that law enforcement and/or fire personnel would be on site to help direct traffic and would be viewed as knowledgeable and credible. Residents will be provided annual education and training regarding fire safety and evacuation events.

Evacuation of Esperanza Hills on a typical day could be completed relatively quickly because residents will be encouraged to practice "Ready, Set, Go!" which will result in residents that will have their valuables ready to load, a pre-evacuation checklist (provided by the HOA) ready to implement, and the peace of mind that their homes are defensible, assuming ongoing maintenance of ignition reduction features.

4.3.3 Evacuation Trigger Threshold

Based on Dudek's review of fire behavior, fire spread rates, fire progression and spotting occurrence during the Freeway Complex Fire in 2008 and other local wildfires and fire behavior modeling, on-site population, area roadways and potential loading, the recommended trigger for Esperanza Hills evacuation/closure is:

1. Red Flag Warning Period: whenever there is an active wildfire burning west of the 71 freeway and north of the 91 freeway and south of the Highway 142 (Carbon Canyon Road) within the Puente Hills (Figure 19) that coincide with declared Red Flag Warning periods, or when ordered to evacuate by fire or law officials, whichever occurs first, the Esperanza Hills Community will conduct an evacuation out of the area, or a partial on-site relocation if directed by fire/law officials. Although wildfires can occur any time of the year, they are more likely to become uncontrollable during the period of roughly May through November, coinciding with the high fire season and particularly during Red Flag Warning weather.
2. Non-Red Flag Warning days: whenever there is an active wildfire burning within a 2.5 mile sphere of the community (Figure 20), or when ordered to evacuate by fire or law officials, whichever occurs first, the community will conduct an evacuation out of the area or a partial relocation if directed by fire/law officials.

4.3.3.1 Analysis

Under extreme weather conditions, wildfire may behave aggressively and unpredictably, significantly increasing the area directly affected, such as the Freeway Complex Fire did during the night of the 1st and 2nd day (November 15th and 16th) when it grew from 10,000 to nearly 24,000 acres in a matter of several hours. Winds associated with extreme weather can carry airborne embers miles ahead of the active fire front, igniting new fires that exponentially accelerate the fire spread rate and proportionally cut down the available time for evacuation. Conversely, fires occurring during the low fire season, when fuel moisture is higher and it is less likely to experience Red Flag Warning conditions (Santa Ana conditions), wildfires that do occur typically burn fewer acres (CAL FIRE 2013). For example, of the 7 fires with month of burning data which burned within 2 miles of the Esperanza Hills site, all occurred within the typical fire season (June through November).

4.3.4 Off-Site Evacuation Protocol

Wildfire occurrence during Red Flag Warning periods (whether during the high fire season or the low fire season) that is distant and allowed time to evacuate would follow a pre-planned protocol including:

4.3.4.1 Wildfire Scenario - Off-site Evacuation

- Local authority notification of wildfire in jurisdiction, determination of early activation of County's mass notification system (Alert OC) as well as radio and television outlets.
- Mass notification system (Alert OC) activated –all telephone numbers within specified area notified via computer of the fire situation. System capability: "significant capacity to send large volumes of messages through phone, email and text" (Alert OC Web page: http://bos.ocgov.com/alertoc/overview.asp). Similar systems have varying capacities from 2,800 calls per minute up to 6,666 calls per minute or 400,000 calls per hour). Alert OC's precise capacities were not available at the time of this FPEP but is at least in the thousands per minute range (Laguna Beach Police 2013).
- Esperanza Hills residents receive notification call within several minutes of fire reporting.
- Community's "Ready, Set, Go!" emergency planning proceeds with residents gathering their pre-planned valuables/necessities and exiting the community
- Vehicles will be directed to exit the community to Yorba Linda Boulevard and west or south from there by law enforcement involved in the evacuation activity.

- When very early evacuation is ordered, the vehicles may be "metered" out of the area with every other car directed to the west or south onto Yorba Linda Boulevard to minimize impacts on area roadways.

- When evacuation is ordered and a larger area is affected and includes shorter lead time, law enforcement will be directing evacuations along major roadways. The Esperanza Hills residents would follow their evacuation pre-plan then follow direction from law enforcement.
- Assuming a maximum of 1,000 people on site at any one time and on a given day, it is estimated that it could take up to 90 minutes or more to move residents from the area to the west.

4.3.5 Wildfire Scenario - Contingency On-Site Relocation

Wildfire scenarios that would not allow enough time to safely evacuate the community are considered a rare possibility. However, fires igniting within the southern portion of the Chino Hills, off of the 91 freeway or in Chino Hills State Park, under Red Flag Warning conditions (such as from a vehicle accident, arson, electrical distribution line, or wind-born embers from a distant wildfire) and driven by wind and rapid spread rates, or backed-up roadways due to heavy evacuation, vehicle accident or other issues may require an alternative to off-site evacuation if extreme spotting occurs. Esperanza Hills residents would receive notification from Alert OC or from radio and television news sources. Once aware of a fire the community's pre-planned, and practiced emergency response would be initiated. Priority evacuation procedures would be implemented immediately. However, should fire and law enforcement personnel determine that a higher risk to people exists during off site evacuation options than if people were to temporarily seek protection inside their well-protected homes, the contingency on-site relocation plan will be initiated in communication with local fire authorities (when possible). Residents cannot be mandated to follow on-site relocation directions, but resident education and training information will be provided and reinforced to raise awareness of the potential danger and potential options during a wildfire emergency. It is anticipated that law enforcement or fire officials would be involved with the decision to remain on site, and therefore, should one or more residents refuse to remain on site, they will be urgently apprised of the danger on the roadway and the need to remain in their home (or an alternate interior structure if they live in a perimeter home).

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FIGURE 19

Potential Evacuation Trigger Threshold – Red Flag Warning Period

ESPERANZA HILLS FIRE PROTECTION AND EMERGENCY EVACUATION PLAN

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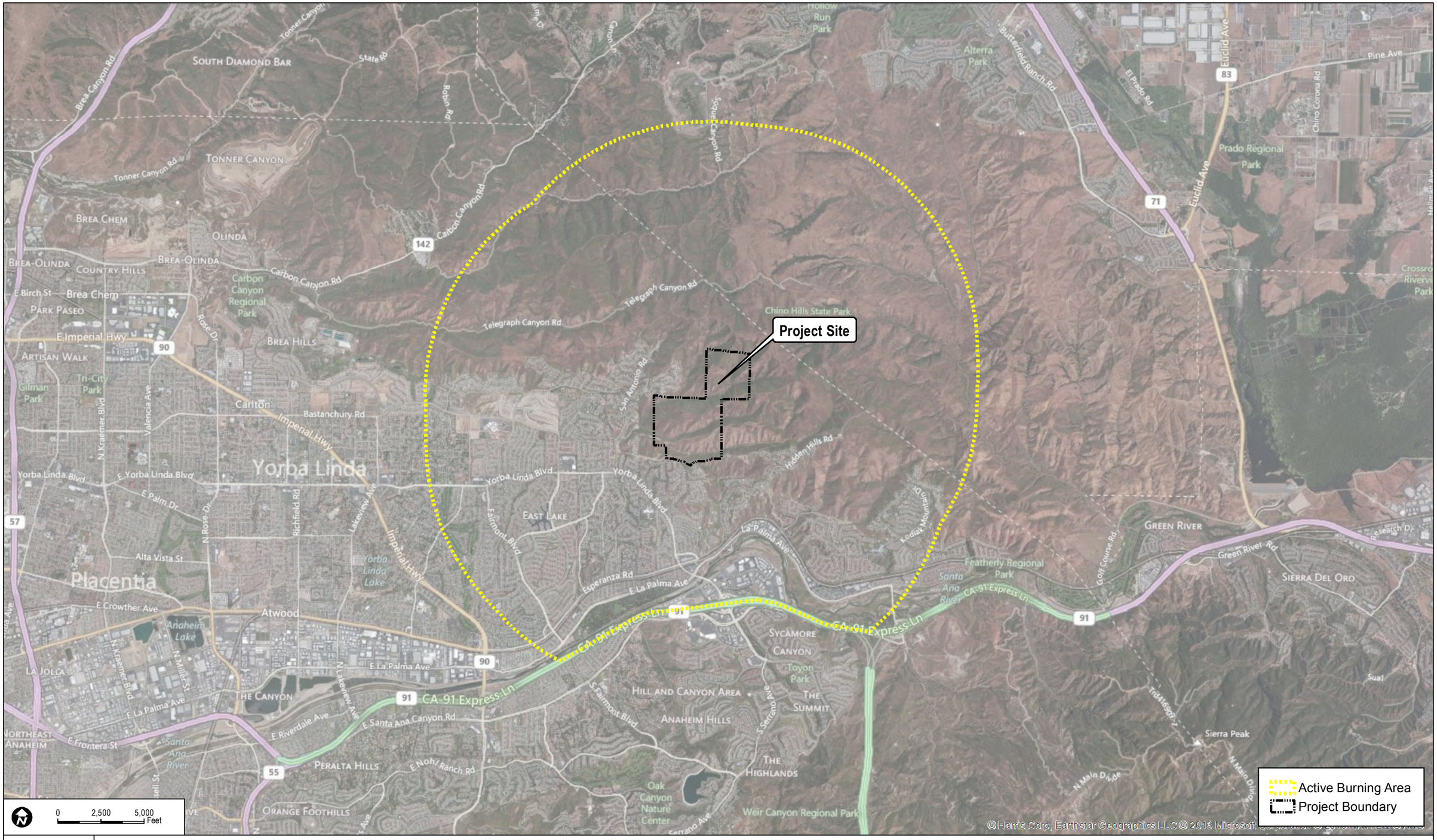

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FIGURE 20

Potential Evacuation Trigger Threshold – Non-Red Flag Warning Period

ESPERANZA HILLS FIRE PROTECTION AND EMERGENCY EVACUATION PLAN

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As noted by the office of the state Fire Marshal, a building will be exposed to the main flame front of a wildfire for a relatively short period of time, 5–10 minutes (Cal Fire 2007). This exposure time will be shorter and less intense when maintained fuel modification zones are in place, as they will on the Esperanza Hills site. Buildings are subject to pre- and post-fire for a longer period of time, which may include wind, flying embers and spot fires. Temporary refuge in any of the newly constructed buildings will be preferable to remaining outdoors, and exposed to the wildfire should off-site evacuation be infeasible. As detailed in this FPEP, the combined fire protection system, including site-specific fuel management zones, enhanced, ignition-resistive construction, interior sprinklers, and infrastructural improvements only possible with the implementation of the proposed site plans results in a significantly reduced potential for structure ignition. The Esperanza Hills property, following implementation and ongoing maintenance of the requirements in this FPEP, will provide its residents with contingency protected areas during a wildfire.

Law enforcement and fire agencies would notify the community (through various sources including driving through the community with loudspeakers) after the fire threat has been controlled or the fire has passed.

This FPEP does not provide a guarantee that all residents and visitors or community members will be safe at all times. There are many variables that may influence overall safety. This FPEP provides requirements and recommendations for implementation of the latest fire protection features that have proven to result in reduced wildfire related risk and hazard. The system of fire protection features must be properly maintained for it to function as designed. Even then, fire can compromise the fire protection features through various, unpredictable ways. The goal is to reduce the likelihood that the system is compromised through implementation of duplicative, redundant layering as provided in this FPEP.

4.3.5.1 Wildfire Scenario – Unsafe to Evacuate Community, Contingency Relocation to On-site Structures

Wildfire Call to 911

- Fire Authority/Law Enforcement/OES notification of wildfire in jurisdiction.
- Once the community is notified (via Alert OC or other means) of a wildfire within or encroaching upon evacuation trigger thresholds, law enforcement will direct residents to evacuate the community or, if aggressive fire is near the community, may call for a partial relocation of residents.
    - If evacuation from the area is required and has been determined can be safely accomplished, the community's residents follow direction and their pre-prepared "Ready, Set, Go!" plans to the west.

- In the event of a wildfire in the surrounding area (too close to consider an "early" community evacuation), law enforcement would close roads to ingress (other than fire department personnel) and would direct and control egress, including the community to use one of the following routes:
  - Option 1: Stonehaven Drive south to Yorba Linda Boulevard, then south or west, as directed by law enforcement.
  - Option 2: Aspen Way west to San Antonio Road, then south to Yorba Linda Boulevard and to the south or west, as directed by law enforcement.
- If safe roadway evacuation is determined not possible by local law enforcement, all persons on site may be advised to remain in their homes. As possible, persons in the perimeter rows of homes (Appendix G and Appendix H) may be relocated to interior areas, neighbors' homes, community center, etc., as a temporary, last resort contingency action.

- If contact with the Fire Authority or law enforcement is not possible and there has not been a mandatory evacuation notice, residents will utilize situational awareness to determine location of fire and based on weather, road conditions, visibility, and provided information from available sources, make determination to evacuate or conduct temporary on-site sheltering areas as all of the site's structures will be capable of withstanding a short-duration vegetation fire in the off-site fuels.

4.3.6 Wildfire Education

Esperanza Hills' residents will be provided on-going education regarding wildfire, the CEP, and this FPEP's requirements. This educational information will support the fire safety and relocation features/plans designed for this community. Informational handouts, community Web-site page, mailers, fire safe council participation, inspections, and seasonal reminders are some methods that will be used to disseminate wildfire and relocation awareness information. The OCFA will review and approve all wildfire educational material/programs before printing and distribution.

The Esperanza Hills HOA will organize fire prevention and "Ready, Set, Go!" evacuation planning meetings at least once a year, timed to occur prior to the onset of the high fire season. The community has prepared an emergency access plan that will be finalized and incorporated into the CEP, which will be given to the residents each year. The HOA website will be capable of providing a back-up texting or messaging option (requires resident participation) to the County's automatic notification system. This back up system can relay messages to residents regarding Red Flag Warning weather, fire prevention, fire emergencies, evacuation notices, or other fire safety alerts.

5.0 IMPLEMENTATION CONDITIONS

The following FPEP implementation measures and conditions summarize the measures that will be provided by the Esperanza Hills Community as part of the proposed development plan and that provide for fire protection and emergency evacuation of the site:

1. 1. Preparation of a Construction Fire Prevention Plan – construction activities include potential for ignition sources at higher levels than at build out. The Construction Fire Prevention Plan will indicate fire prevention practices, restrictions on hot works (any work that could produce sparks – cutting, welding, open torch, grinding, braising, small engine equipment, etc.), site safety equipment, post-hot work fire watch, Red Flag Weather restrictions, and training for construction personnel.
    a. Applicant/owner will contract with OCFA during site grubbing for Type III brush engine and crew to be available.
    b. Fuel modification zones will be provided prior to combustibles being brought onto the site.
    c. On-going restrictions on Hot Works (California Fire Code, Section 2601.2) will apply on the site. All precautions and safety procedures will be in place, including required permits, before hot work is conducted. In addition, Hot Work conducted during Red Flag Warning periods will be limited to within an approved structure with no hot work occurring outside, unless a 50-foot radius area clear of combustibles is provided and a water truck is on site and in a ready condition.
    d. Between May 1 and November 30 of each year, and when Red Flag Watches or Warnings have been declared, a water truck shall be on-hand during all construction activities with the potential to ignite fires, including but not limited to welding, pipe cutting, grinding, grubbing, and rough grading.
2. The community's buildings will be constructed of ignition resistant construction materials based on the latest Building and Fire Codes:
    a. Exterior fire-rated walls
    b. Ignition resistant roof assembly
    c. Dual pane, tempered windows
    d. Ember resistant vents
    e. Eave protection
    f. Underfloor and appendage protection
    g. Interior sprinklers that include an attic head, exceeding the code requirement.

3. Fuel Modification will be provided throughout the perimeter of the site and will meet OCFA's 170 feet wide, four zone guideline, except for 3 lots, ranging between 140 and 157 feet in width (Lots 7, 8, and 9 for Option 1 or Lots 8, 9, and 10 for Option 2). These 3 lots will include several compensating provisions, detailed in the project's Alternative Materials and Methods report (Dudek 2013):
    a. The lots include a series of retaining walls at the property line inward, providing up to 42 feet of vertical separation of the structure from adjacent wildland fuels.
    b. A non-combustible (masonry) view wall will be placed at the top of, and slightly set back from the retaining wall, (edge of pad) to provide additional vertical heat deflection.
    c. There will be restrictions on the type of ancillary structures allowed in the Zone A, with only non-combustible structures allowed.
    d. Structure windows will be upgraded to dual pane, both panes tempered.
4. The Esperanza Hills community will annually hire a fuel modification inspector to assess the site's fuel conditions and recommend actions to meet the OCFA requirements detailed in this FPEP. The inspector will provide a letter indicating compliance that the community will submit to the OCFA by June each year indicating the landscape is in a reduced fuel condition.
5. Large sections of native fuels will be converted to fuel modification in the south/southwest portions of the project between Esperanza Hills and the existing Yorba Linda communities. These large fuel modification areas will have a significant positive effect on reducing ignitions and fire intensity and slowing fire spread.
6. Site riparian woodlands will be restored/enhanced through removal of dead, dying, non-native, and highly flammable plants, creation of vertical separation, and removal of ladder fuels.
7. Fire apparatus access roads will be provided throughout the community that meet OCFA's requirements including approved widths, dead end road lengths, and cul-de-sacs. Fire access to within 150 feet of the furthest point of all structures, accommodating hose pull from hydrants and/or engine and exceeding OCFA's 300-foot standard for sprinklered buildings.
8. Staging areas throughout the community are provided in designated, OCFA site selected locations as well as along roadways, cul-de-sacs and parks.
9. Water availability and delivery improvements (gravity fed) provide for a reliable water source for consumers and at the provided fire hydrants during daily and emergency usage.

10. Community Homeowner's Association annual fire evacuation drill/fire exercise to ensure proper safety measures have been implemented, community awareness and preparation of individual and community-wide "Ready, Set, Go!" plans.
11. The project will use a conservative evacuation trigger threshold for deciding when to evacuate the site if an evacuation has not already been ordered by fire and law officials. An evacuation will occur on declared Red Flag Warning days when an active wildfire is burning within the Chino Hills, as delineated in the Evacuation Trigger Point exhibit (Figures 15 and 16).
12. The project includes a contingency plan for the rare occurrence that evacuation is not safe that temporarily moves residents from perimeter houses to community-interior structures (community association or to neighbor houses), which are well protected, ignition resistant structures that will be appropriate for short-term, emergency sheltering.
13. The project will include a proactive community wildfire education program utilizing a multi-pronged approach to fire safety including landscape/fuel modification, private property maintenance, "Ready, Set, Go!" preparations, and personal evacuation plans.

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6.0 CONCLUSION

This Fire Protection and Emergency Evacuation Plan (FPEP) is submitted in support of an application for implementation of the Esperanza Hills Residential Development Plan. The plan includes construction of of new, ignition resistant buildings, and related infrastructure including fire apparatus access roads and utilities. This FPEP is submitted as a supplement to the project's Environmental Impact Report to analyze the potential fire risk, guide fire prevention and fire safety on the site, document the measures implemented to mitigate risk, and plan for wildfire evacuations. The recommendations in this document meet fire safety, building design elements, fuel management/modification, and landscaping recommendations of the applicable codes, unless otherwise stated herein.

The recommendations provided in this FPEP have been designed specifically for the proposed construction of structures adjacent the WUI zone within Orange County at the Esperanza Hills site. The project's fire protection system includes a redundant layering of protection methods that have been analyzed through post-fire damage assessments and found to reduce risk of structure ignition and prepare communities for early evacuation. For wildfire emergencies, the project will follow the "Ready, Set, Go!" model adopted by the State of California and the County of Orange. Accordingly, the Esperanza Hills community will be "Ready" by taking a proactive stance on preparedness, training drills, and resident education, and evacuation planning efforts. The community will be "Set" by closely monitoring the situation whenever wildland fire occurs within Orange County or Riverside County areas to the east, and elevating pre-planned protocol activities and situation awareness. Lastly, the community will "Go" by executing the pre-planned evacuation procedures in a conservative manner, i.e., evacuation will occur based on a conservative trigger, as defined in this FPEP or when directed by fire and law enforcement personnel, whichever is more conservative. The preferred alternative will always be early relocation from the site based on a conservative evacuation trigger threshold. However, should a fire occur immediately adjacent to the community that, as determined by law enforcement, fire officials, and/or Office of Emergency Services, results in unsafe evacuation (fire along evacuation route, overloaded roadways, etc.), the community will be prepared for a contingency plan that temporarily houses residents and visitors until it is safe to evacuate or the threat has passed.

All new structures on the site will be constructed to the latest codes including ignition-resistant exterior walls, roofs, eaves, and vents along with interior sprinklers. Fuel modification would occur site-wide, meeting the OCFA's 170 feet guidelines for all but three lots, which will be required to incorporate alternative materials and methods resulting in same practical effect as the fuel modification zone intent. The site's fuel modification areas will be maintained and inspected annually by an Esperanza Hills-hired and OCFA approved fuel

modification inspector. Fuels will be removed as necessary throughout the year including removal of all dead and dying materials and prohibited species, maintaining appropriate horizontal and vertical spacing and fuel densities and spatial distribution.

The site improvements are designed to facilitate emergency apparatus and personnel access to larger portions of the site than currently is provided. Driveway and road improvements (widening, paving) and additional on-site roadways with fire engine turnarounds provide access to within 150 feet of all sides of every building. Water availability and flow will be consistent with OCFA requirements including fire flow and hydrant distribution. These features along with the ignition resistance of all buildings, the interior sprinklers, and the pre-planning, training and awareness will assist responding firefighters through prevention, protection and suppression capabilities.

Ultimately, it is the intent of this FPEP to guide the implementation of the Esperanza Hills Development Plan such that the site is defensible from wildfire, does not represent significant threat of ignition source for the adjacent native habitat or communities, is accessible by fire and medical emergency personnel, and establishes a pre-defined, practiced protocol for evacuations. Secondary benefits for existing communities include a large wildfire buffer created by the Esperanza Hills project and its wide fuel modification zones and strategically located fuel breaks. However, during extreme fire conditions, there are no guarantees that a given structure will not burn. Fire safety measures identified in this report are designed to reduce the likelihood that fire would impinge upon the Esperanza Hills community and its proposed structures. Wildfires may occur in the area that could damage property or harm persons. However, implementation of the recommendations in this FPEP will substantially reduce the risk associated with this project's wildfire hazard location.

Although the proposed project and landscape will be significantly improved in terms of ignition resistance, it should not be considered a "shelter-in-place" site except as defined in this FPEP. It is recommended that the evacuation process is carried out with a conservative approach to fire safety. This approach must include maintaining the landscape and structural components according to the appropriate standards and embracing a "Ready, Set, Go!" stance on evacuation. Accordingly, evacuation of the site and the area should occur according to the pre-established evacuation trigger points, or as soon as they receive notice to evacuate, which may vary depending on many environmental and other factors, whichever is more conservative. Fire is a dynamic and somewhat unpredictable occurrence and it is important for anyone living at the wildland-urban interface to educate themselves on practices that will improve safety.

7.0 REFERENCES

Anderson, Hal E. 1982. *Aids to Determining Fuel Models for Estimating Fire Behavior*. USDA Forest Service Gen. Tech. Report INT-122. Intermountain Forest and Range Experiment Station, Ogden, Utah. http://www.fs.fed.us/rm/pubs_int/int_gtr122.pdf

Andrews, Patricia L.; Bevins, Collin D.; Seli, Robert C. 2005. BehavePlus fire modeling system, version 4.0: User's Guide Revised. Gen. Tech. Rep. RMRS-GTR-106WWW Revised. Ogden, Utah: Department of Agriculture, Forest Service, Rocky Mountain Research Station. 132p.

Andrews, Patricia L. 2009. BehavePlus fire modeling system, version 5.0: Variables. Gen. Tech. Rep. RMRS-GTR-213WWW Revised. Fort Collins, Colorado: Department of Agriculture, Forest Service, Rocky Mountain Research Station. 111 p. http://www.fs.fed.us/rm/pubs/rmrs_gtr213.pdf

Barro, Sue. 1989. [Email to Bill Fischer]. April 29. Riparian vegetation after fire - a case study. Riverside, CA: U.S. Department of Agriculture, Forest Service, Pacific Southwest Forest and Range Experiment Station, Forest Fire Laboratory. On file at: U.S. Department of Agriculture, Forest Service, Rocky Mountain Research Station, Fire Sciences Laboratory, Missoula, MT; RWU 4403 files. [6815]

CAL FIRE (California Department of Forestry and Fire Protection). 2013. Fire and Resource Assessment Program. Website Accessed April 25.http://frap.cdf.ca.gov/

Collins, S. L. 2004. Evaluation of Evacuation Planning in Wildland-Urban Interface Environments. Executive Analysis of Fire Service Operations in Emergency Management. Applied Research project submitted to the National Fire Academy as part of the Executive Fire Officer Program. 44 pp.

Davis, Frank W.; Keller, Edward A.; Parikh, Anuja; Florsheim, Joan. 1989. Recovery of the chaparral riparian zone after wildfire. In: Protection, management, and restoration for the 1990's: Proceedings of the California riparian systems conference; 1988 September 22-24; Davis, California. Gen. Tech. Rep. PSW-110. Berkeley, California: U.S. Department of Agriculture, Forest Service, Pacific Southwest Forest and Range Experiment Station: 194-203. [13883]

Drabek, T.E. 1991. Anticipating organizational evacuations: disaster planning by managers of tourist-oriented private firms. International Journal of Mass Emergencies and Disasters. 9, (2), 219-245.

Drabek, T.E., 2004. Sociology, Disasters and Emergency Management: History, Contributions, and Future Agenda. In: Disciplines, Disasters and Emergency Management: The Convergence and Divergence of Concepts, Issues and Trends in the Research Literature. Edited by David McEntire. 34 pp.

Finklin, A.I. and W.C. Fischer. 1990. Weather Station Handbook – An Interagency Guide for Wildland Managers. National Wildfire Coordinating Group PMS 426-2/NFES 2140.

Finney, M.A. 1998. FARSITE: Fire Area Simulator—model development and evaluation. Res. Pap. RMRS-RP-4, Ogden, Utah: U.S. Department of Agriculture, Forest Service, Rocky Mountain Research Station. 47 p.

FireFamily Plus. 2002. U.S. Department of Agriculture, Forest Service, Rocky Mountain Research Station. 124 p

Fitzpatrick, C. and Mileti, D.S. 1994. Public Risk Communication. In Dynes R. R. & Tierney, K.J. (Eds) 1994. Disasters, Collective Behavior, and Social Organization. Newark University of Delaware Press, 71-98.

Glenn Lukos Associates, Inc. 2013. Biological Technical Report for the 504-acre Esperanza Hills Specific Plan Property and Associated Offsite Impact Areas, Unincorporated Orange County, California. 101 pp.

Gordon, R. 2006. Acute Responses to Emergencies: findings and observations of 20 years in the field. The Australian Journal of Emergency Management, Vol. 21, No. 1, February 2006. 23 pp.

International Fire Chiefs Association. 2013. “Ready, Set, Go” website link: http://wildlandfirersg.org/

Keeley, J.E. and S.C. Keeley. 1984. Postfire recovery of California coastal sage scrub. The American Midland Naturalist 111:105-117.

Lindell, M.K. & Perry, R.W. 2004. Communicating Environmental Risk in Multiethnic Communities. Thousand Oaks, California: Sage Publications.

Minnich, R.A. 1983. Fire mosaics in Southern California and northern Baja California. *Science*. 219:1287-1294.

Minnich, R.A. 1987. Fire behavior in Southern California chaparral before fire control: the Mount Wilson burns at the turn of the century. *Annals of the Association of American Geographers*. 77(4): 599-618.

Minnich, R.A. and Y.H. Chou. 1997. Wildland fire patch dynamics in the chaparral of Southern California and northern Baja California. *International Journal of Wildland Fire*. 7(3): 221-248.

Moritz, M.A. 2003. Spatiotemporal analysis of controls on shrubland fire regimes: age dependency and fire hazard. *Ecology*. 84(2):351-361. http://nature.berkeley.edu/moritzlab/docs/Moritz_2003_Ecology.pdf

Moritz, M.A., J.E. Keeley, E.A. Johnson, and A.A. Schaffner. 2004. Testing a basic assumption of shrubland fire management: How important is fuel age? *Frontiers in Ecology and the Environment* 2:65-70. http://www.werc.usgs.gov/seki/pdfs/Link4106.pdf

Orange County Fire Authority. 2008. After Action Report – Freeway Complex Fire. 125 pp.

Orange County Fire Authority. 2011. Vegetation Management: Technical Design for New Construction Fuel Modification Plans and Maintenance Program. OCFA Guideline C-05. January 1, 2011.

Quarantelli, E.L. and Dynes, R.R. 1977. Response to social crisis and disasters. Annual Review of Sociology. 3, 23-49.

Ramsey and Rudolph. 2003. Landscape and Building Design for Bushfire Areas. Melbourne., Victoria : CSIRO Publishing, c2003. viii, 104 p. : ill ; 22cm

Remote Automated Weather Stations (RAWS). 2007. http://www.fs.fed.us/raws/

Rothermel, Richard C. 1983. *How to Predict the Spread and Intensity of Forest and Range Fires*. USDA Forest Service Gen. Tech. Report INT-143. Intermountain Forest and Range Experiment, Ogden, Utah. http://www.treesearch.fs.fed.us/pubs/24635

Scott, Joe H. and Robert E. Burgan. 2005. *Standard Fire Behavior Fuel Models: A Comprehensive Set for Use with Rothermel's Surface Fire Spread Model*. Gen. Tech. Rep. RMRS-GTR-153. Fort Collins, Colorado: U.S. Department of Agriculture, Forest Service, Rocky Mountain Research Station. 72 p.

Shroeder, M.J. and C.C. Buck. 1970. Fire weather – A guide for application of meteorological information to forest fire control operation. USDA Forest Service Agricultural Handbook 36D.

Steinberg, Peter D. 2002. Quercus agrifolia. In: Fire Effects Information System, [Online]. U.S. Department of Agriculture, Forest Service, Rocky Mountain Research Station, Fire Sciences Laboratory (Producer). Available: http://www.fs.fed.us/database/feis/ [2013, May 4].

Weise, D.R. and J. Regelbrugge. 1997. Recent chaparral fuel modeling efforts. Prescribed Fire and Effects Research Unit, Riverside Fire Laboratory, Pacific Southwest Research Station. 5p.

WRCC (Western Regional Climate Center). 2013a. Climate of California. Accessed online May 2013. http://www.wrcc.dri.edu/narratives/california/.

WRCC. 2013b. Period of Record General Climate Summary, Yorba Linda, California. Accessed online May 2013. http://www.wrcc.dri.edu/cgi-bin/cliMAIN.pl?ca9847

Orange County Fire Authority. 2008. After Action Report – Freeway Complex Fire. 125 pp.

APPENDIX A

Site Photograph Log

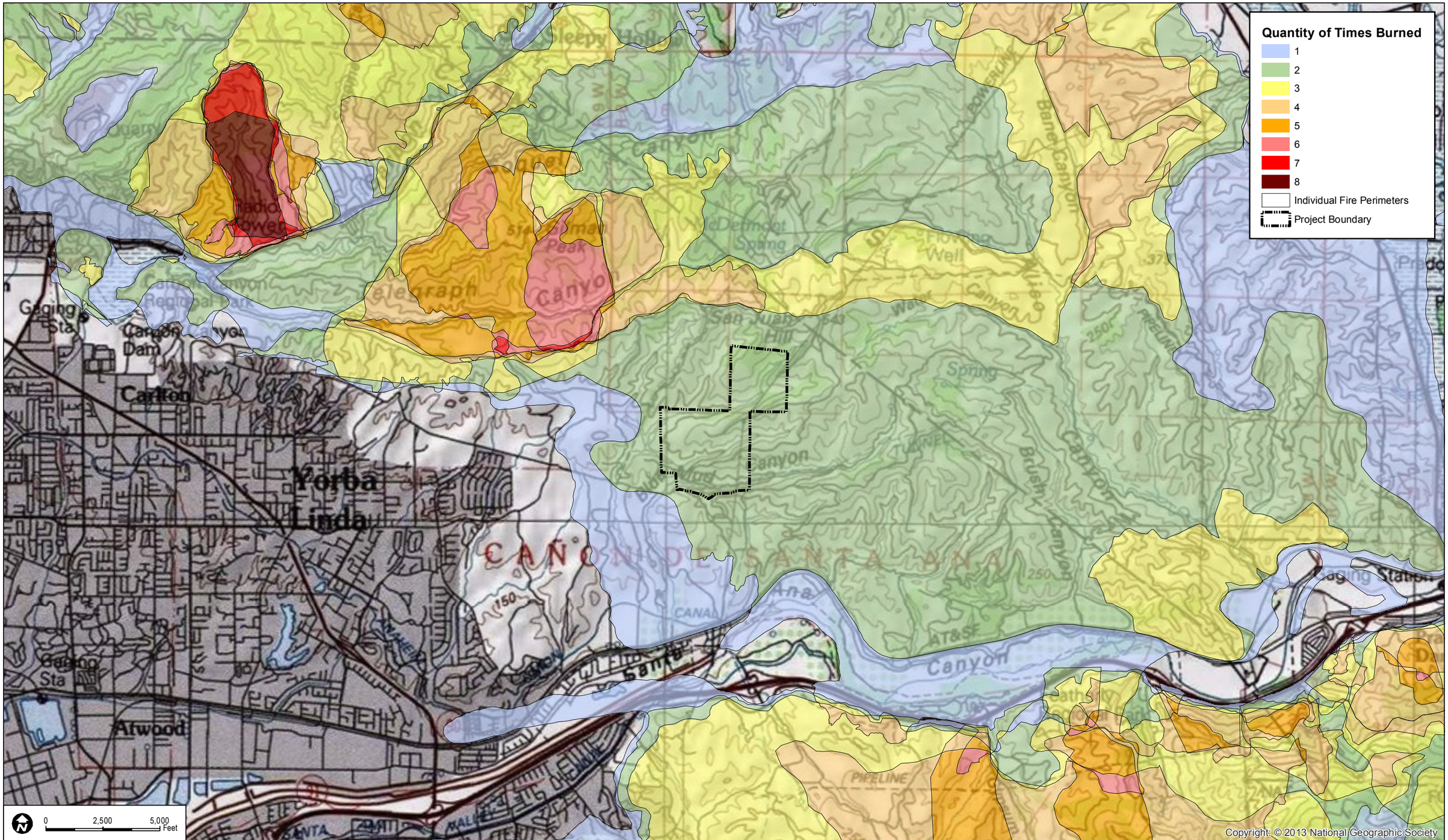
Esperanza Hills Project

Photo Log

Site Visited February 2013

APPENDIX B

Esperanza Hills Vicinity
Fire History Exhibit



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APPENDIX B

Fire History Exhibit

ESPERANZA HILLS FIRE PROTECTION AND EMERGENCY EVACUATION PLAN

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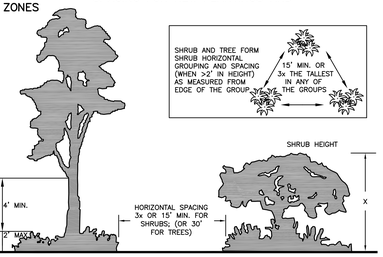
APPENDIX C

Option 1 Conceptual Fuel Modification Plan

ATTACHMENT 6: TREE AND TREE-FPRM SHRUB PRUNING AND SPACING FOR NEW PLANTINGS AND THINNING ZONES



HORIZONTAL SPACING

LESS THAN 2 FEET IN HEIGHT (GROUNDCOVER/GRASSES):
- NO HORIZONTAL SPACING OR VERTICAL SEPARATION IS REQUIRED. GROUNDCOVER/GRASSES SHOULD COVER THE ENTIRE GROUND BETWEEN GROUPS OF SHRUBS OR TREES. GROUNDCOVER SHALL NOT EXCEED 2 FEET IN HEIGHT.

2 FEET IN HEIGHT OR GREATER:

SHRUB AND TREE GROUP SIZE:
- ALL SHRUBS AND TREES CAN BE IN GROUPS OF 3 SPECIMENS OR LESS. NO HORIZONTAL SPACING IS REQUIRED INSIDE THE GROUP.

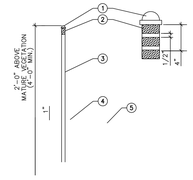
SHRUB/TREE-FORM SHRUB GROUP SPACING:
- GROUPS OF SHRUBS SHALL BE SPACED BE THE GREATER OF THE FOLLOWING TWO MEASUREMENTS: A DISTANCE OF 15 FEET MINIMUM (OR) 3 TIMES THE HEIGHT OF THE TALLEST SPECIMEN IN ANY OF THE GROUPS.
- NO VEGETATION OVER 2 FEET IN HEIGHT IS ALLOWED WITHIN 15 FEET FROM THE EDGE OF TREE CANOPY(S)

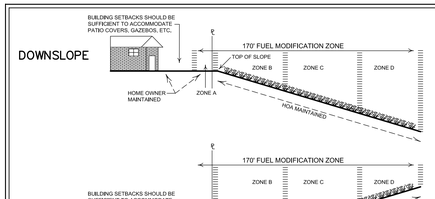
TREE GROUP SPACING:
- GROUPS OF TREES SHALL BE SPACED BY A DISTANCE OF 30 FEET MINIMUM REGARDLESS OF HEIGHT

VERTICAL SPACING

LESS THAN 10 FEET IN HEIGHT:
- WHEN THE FUEL MODIFICATION ZONE IS WITHIN 30 FEET OF THE STRUCTURE, A VERTICAL SEPARATION OF 2 FEET MINIMUM IS REQUIRED FROM THE VEGETATION BELOW. (NOT REQUIRED IS SHRUBS ARE FURTHER THAN 30 FEET FROM STRUCTURE).

10 FEET IN HEIGHT OR GREATER:
- A VERTICAL SEPARATION OF 4 FEET MINIMUM IS REQUIRED TO BE MAINTAINED FROM THE VEGETATION BELOW.
- TREES ONLY: ALL VEGETATION LOCATED UNDERNEATH TREES, SHALL BE A MAXIMUM OF 2 FEET IN HEIGHT.





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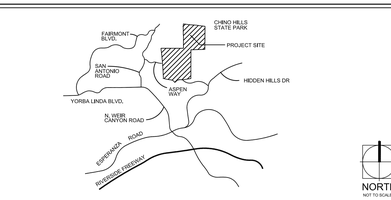

VICINITY MAP

ATTACHMENT 7: UNDESIRABLE PLANT SPECIES (TARGET SPECIES)

CERTAIN PLANTS ARE CONSIDERED TO BE UNDESIRABLE IN THE LANDSCAPE DUE TO CHARACTERISTICS THAT MAKE THEM HIGHLY FLAMMABLE. THESE CHARACTERISTICS CAN BE EITHER PHYSICAL OR CHEMICAL. PHYSICAL PROPERTIES THAT WOULD CONTRIBUTE TO HIGH FLAMMABILITY INCLUDE LARGE AMOUNTS OF DEAD MATERIAL RETAINED WITHIN THE PLANT, ROUGH OR PEELING BARK, AND THE PRODUCTION OF COPIOUS AMOUNTS OF LITTER. CHEMICAL PROPERTIES INCLUDE THE PRESENCE OF VOLATILE SUBSTANCES SUCH AS OILS, RESINS, WAX, AND PITCH. CERTAIN NATIVE PLANTS ARE NOTORIOUS FOR CONTAINING THESE VOLATILE SUBSTANCES.

PLANTS WITH THESE CHARACTERISTICS SHALL NOT BE PLANTED IN ANY OF THE FUEL MODIFICATION ZONES. SHOULD THESE SPECIES ALREADY EXIST WITHIN THE AREAS, THEY SHALL BE REMOVED BECAUSE OF THE POTENTIAL THREAT THEY POSE TO ANY STRUCTURES. THEY ARE REFERRED TO AS TARGET SPECIES SINCE THEIR COMPLETE REMOVAL IS A CRITICAL PART OF HAZARD REDUCTION. THESE FIRE-PRONE PLANT SPECIES INCLUDE (BUT NOT LIMITED TO):

BOTANICAL NAME	COMMON NAME
CYNARA CARDUNCULUS	ARTICHOKE THISTLE
RICINUS COMMUNIS	CASTOR BEAN PLANT
CIRSIUM VULGARE	WILD ARTICHOKE
BRASSICA NIGRA	BLACK MUSTARD
SILYBUM MARIANUM	MILK THISTLE
SACSOLA AUSTAILS	RUSSIAN THISTLE/TUMBLEWOOD
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URTICA URENS	BURNING NETTLE
CARDARIA DRABA	NOARY CRESS, PEPPERGRASS
BRASSICA RAPA	WILD TURNIP, YELLOW MUSTARD
ADENOSTOMA FASCICULATUM	CHAMISE
ADENOSTOMA SPARSIFOLIUM	RED SHANKS
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CORTADERIA	PAMPAS GRASS
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ATTACHMENT 8: PLANTING PALLETTE FOR FUEL MODIFICATION ZONE B

ZONE B SHALL BE CLEARED OF ALL UNDESIRABLE PLANT SPECIES, IRRIGATED, AND PLANTED WITH SPECIES LISTED BELOW

PROPOSED PLANT PALETTE BOTANICAL NAME	COMMON NAME	SPACING
TREE:		
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CERCIS OCCIDENTALIS	WESTERN REDBUD	
PLATANUS RACEMOSA	CALIFORNIA SYCAMORE	
RHUS LANCEA	AFRICAN SUMAC	
TECOMA STANS (STENOLOBIUM STANS)	YELLOW BELLS	
SHRUBS:		
ABELIA X GRANDIFLORA	GLOSSY ABELIA	8' o.c.
CISTUS X PURPUREUS	ORCHID ROCKROSE	6' o.c.
COTONEASTER BUXIFOLIUS	(NO COMMON NAME)	5' o.c.
ELAEAGNUS PUNGENS	SILVERBERRY	12' o.c.
LANTANA CAMARA CULTIVARS	YELLOW SAGE	5' o.c.
LEUCOPHYLLUM FRUTESCENS	TEXAS RANGER	6' o.c.
PHOTINIA FRASERI	PHOTINIA	12' o.c.
PYRACANTHA SPECIES	FIRETHORN	8' o.c.
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SALVIA GREGGII	AUTUMNS SAGE	5' o.c.
XYLOSMA CONGESTUM	SHINNY XYLOSMA	12' o.c.
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ARCTOSTAPHYLOS 'PACIFIC MIST'	PACIFIC MIST MANZANITA	10' o.c.
BACCHARIS PILULARIS VAR. PILULARIS	TWIN PEAKS #2	5' o.c.
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LONICERA JAPAONICA 'HALLIANA'	HALL'S HONEYSUCKLE	4' o.c.
MYOPORUM PARVIFOLIUM	(NO COMMON NAME)	6' o.c.
TECOMARIA CAPENSIS	CAPE HONEYSUCKLE	5' o.c.
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STATE RESPONSIBILITY AREA, VERY HIGH FIRE HAZARD SEVERITY ZONE (VHFHSZ) NOTE:

This County of Orange area has been designated a very high fire hazard severity zone protection area. All development guidelines for a very high fire hazard severity zone protection area (VHFHSZ) pertaining to width of roads, fire sprinkler systems, building construction features, and fuel modification plan submittal shall be met in addition to the OCFA fuel modification criteria on this plan.

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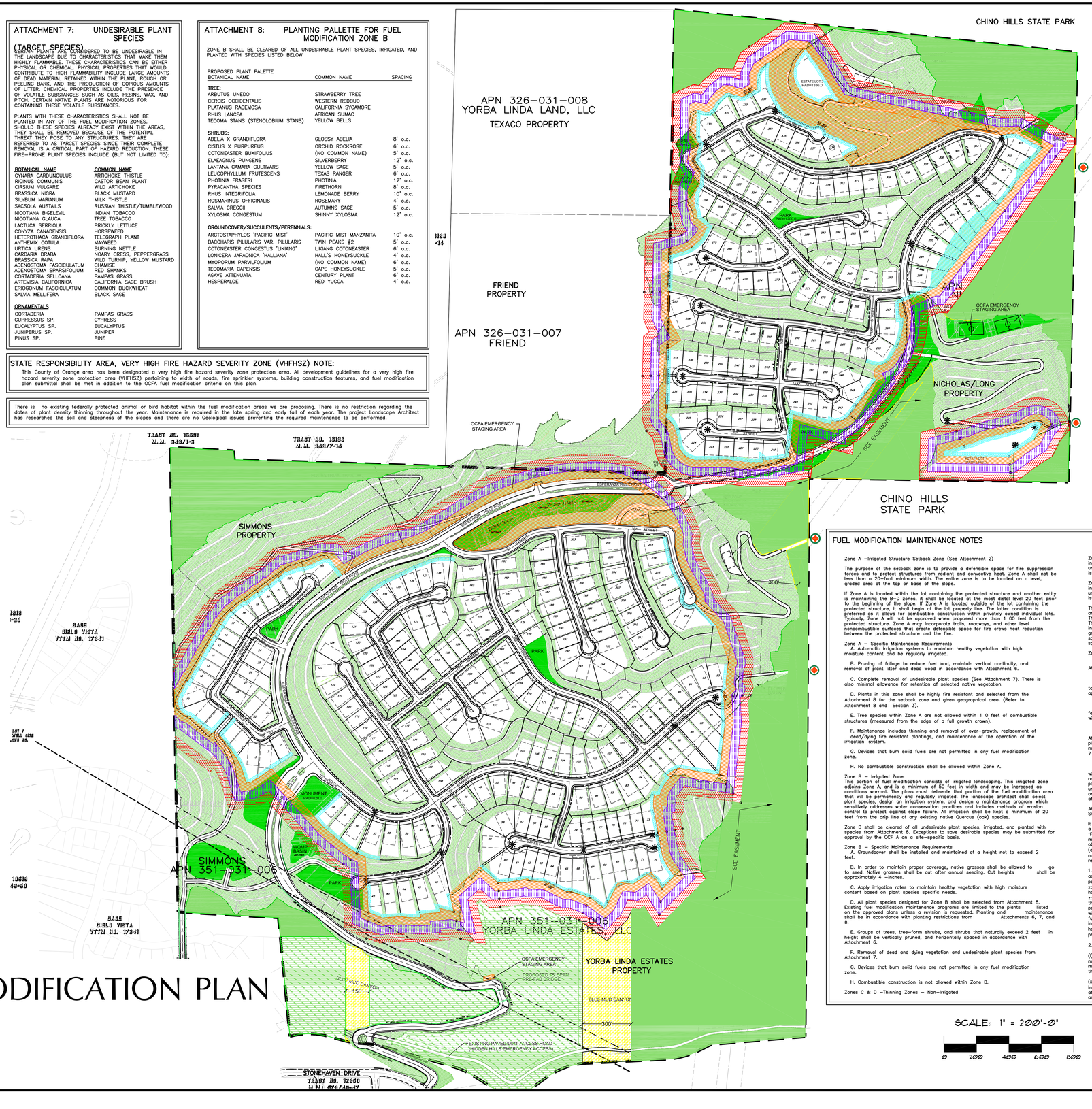

FUEL MODIFICATION LEGEND

- ZONE A (FLAT) – NON-COMBUSTIBLE CONSTRUCTION
- ZONE B – WET ZONE (100% REMOVAL NATIVE SHRUBS)
- ZONE C – DRY ZONE (50% THINNING NATIVE SHRUBS)
- ZONE D – DRY ZONE (30% THINNING NATIVE SHRUBS)
- SHADED FUEL BREAK ZONE: ALL VEGETATION IN THIS ZONE TO BE CUT DOWN TO GRADE AND MAINTAINED AS A FUEL BREAK AS REQUIRED BY OCFA
- NON-NATIVE VEGETATION REMOVAL ZONE: ALL NON-NATIVE VEGETATION IN THIS ZONE OF NATURAL OPEN SPACE TO BE REMOVED
- VEGETATION MANAGEMENT ZONE: ALL VEGETATION IN THIS ZONE TO BE IRRIGATED AND MAINTAINED AS REQUIRED BY OCFA

SYMBOL LEGEND

- FIRE ACCESS POINT (A 5' NON-COMBUSTIBLE TUBULAR STEEL GATE) 500' MINIMUM DISTANCE BETWEEN FUEL MODIFICATION ACCESS POINTS
- FUEL MODIFICATION ZONE MARKER
- PERMANENT IDENTIFICATION MARKERS SHALL BE CONSTRUCTED TO IDENTIFY THE LIMITS OF APPLICABLE FUEL MODIFICATION ZONES. MARKER DESIGN SHALL BE 2" dia. X 8'-0" LONG GALVANIZED PIPE, EMBED MINIMUM 2'-6" INTO SOLID GROUND, STENCIL TOP 6" WITH A LETTER 'B', 'C' OR 'D'. EXPOSE PIPE 2'-0" ABOVE VEGETATION MINIMUM. SEE DETAIL ON LEFT.
- ROAD CONNECTS TO EXISTING CHINO HILLS STATE PARK ROAD AT THIS POINT
- NATURAL OPEN SPACE
- IRRIGATED LANDSCAPE SLOPES/ENTRY/MEDIANS
- IRRIGATED LANDSCAPE PARKS/OPEN SPACE
- 242 LOT NUMBER
- PROPERTY BOUNDARY

FUEL MODIFICATION MAINTENANCE NOTES

Zone A –Irrigated Structure Setback Zone (See Attachment 2)

The purpose of the setback zone is to provide a defensible space for fire suppression forces and to protect structures from radiant and convective heat. Zone A shall not be less than a 20–foot minimum width. The entire zone is to be located on a level, graded area at the top or base of the slope.

If Zone A is located within the lot containing the protected structure and another entity is maintaining the B–D zones, it shall be located at the most distal level 20 feet prior to the beginning of the slope. If Zone A is located outside of the lot containing the protected structure, it shall begin at the lot property line. The latter condition is preferred as it allows for combustible construction within privately owned individual lots. Typically, Zone A will not be approved when proposed more than 1 00 feet from the protected structure. Zone A may incorporate trails, roadways, and other level noncombustible surfaces that create defensible space for fire crews heat reduction between the protected structure and the fire.

Zone A – Specific Maintenance Requirements
A. Automatic irrigation systems to maintain healthy vegetation with high moisture content and be regularly irrigated.

B. Pruning of foliage to reduce fuel load, maintain vertical continuity, and removal of plant litter and dead wood in accordance with Attachment 6.

C. Complete removal of undesirable plant species (See Attachment 7). There is also minimal allowance for retention of selected native vegetation.

D. Plants in this zone shall be highly fire resistant and selected from the Attachment B for the setback zone and given geographical area. (Refer to Attachment B and Section 3).

E. Tree species within Zone A are not allowed within 1 0 feet of combustible structures (measured from the edge of a full growth crown).

F. Maintenance includes thinning and removal of over–growth, replacement of dead/dying fire resistant plantings, and maintenance of the operation of the irrigation system.

G. Devices that burn solid fuels are not permitted in any fuel modification zone.

H. No combustible construction shall be allowed within Zone A.

Zone B – Irrigated Zone
This portion of fuel modification consists of irrigated landscaping. This irrigated zone adjoins Zone A, and is a minimum of 50 feet in width and may be increased as conditions warrant. The plans must delineate that portion of the fuel modification area that will be permanently and regularly irrigated. The landscape architect shall select plant species, design an irrigation system, and design a maintenance program which sensitively addresses water conservation practices and includes methods of erosion control to protect against slope failure. All irrigation shall be kept a minimum of 20 feet from the drip line of any existing native Quercus (oak) species.

Zone B shall be cleared of all undesirable plant species, irrigated, and planted with species from Attachment B. Exceptions to save desirable species may be submitted for approval by the OCF A on a site–specific basis.

Zone B – Specific Maintenance Requirements
A. Groundcover shall be installed and maintained at a height not to exceed 2 feet.

B. In order to maintain proper coverage, native grasses shall be allowed to go to seed. Native grasses shall be cut after annual seeding. Cut heights shall be approximately 4 –inches.

C. Apply irrigation rates to maintain healthy vegetation with high moisture content based on plant species specific needs.

D. All plant species designed for Zone B shall be selected from Attachment 8. Existing fuel modification maintenance programs are limited to the plants listed on the approved plans unless a revision is requested. Planting and maintenance shall be in accordance with planting restrictions from Attachments 6, 7, and 8.

E. Groups of trees, tree–form shrubs, and shrubs that naturally exceed 2 feet in height shall be vertically pruned, and horizontally spaced in accordance with Attachment 6.

F. Removal of dead and dying vegetation and undesirable plant species from Attachment 7.

G. Devices that burn solid fuels are not permitted in any fuel modification zone.

H. Combustible construction is not allowed within Zone B.

Zones C & D –Thinning Zones – Non–Irrigated

Zone C is 50 feet in width and requires horizontal and vertical spacing of plant groups in accordance with Attachment 6 and removal of all dead and dying vegetation and undesirable species from Attachment 7. Minimum thinning percentage of plant removal is 50%.

Zone D is 50 feet in width and requires horizontal and vertical spacing of plant groups in accordance with Attachment 6 and removal of all dead and dying vegetation and undesirable species from Attachment 7. Minimum thinning percentage of plant removal is 30%.

Thinning zones reduce the fuel load of a wildland area adjacent to the irrigated zones and urban development, reducing heat and ember production from wildland fires. Thinning zones adjoin Zone B and can extend 100 feet or more into wildland areas. The total percentage of vegetation to be removed is determined by many factors, including topography, exposure, vegetation type, and vegetation density. Sometimes a greater thinning percentage than the minimum may be temporarily needed to meet spacing requirements from Attachment 6or the removal of dead and undesirable species.

Zone C and D – Specific Maintenance Requirements
A. Removal of dead and dying vegetation and undesirable plant species from Attachment 7.

B. In order to maintain proper coverage, native grasses shall be allowed to go to seed. Native grasses shall be cut after annual seeding. Cut heights shall be approximately 4 inches.

C. Groups of trees, tree–form shrubs, and shrubs that naturally exceed 4 feet in height shall be vertically pruned, and horizontally spaced in accordance with Attachment 6.

D. Plants species introduced into Zone C or D shall be selected from Attachment 8. Existing fuel modification maintenance programs are limited to the plants listed on the approved plans unless a revision is requested. Planting and maintenance shall be in accordance with planting restrictions from Attachments 7 and 8. (See Section 3)

E. Reduce fuel loading by reducing fuel in each remaining shrub or tree without substantial decrease in the canopy cover or removal of tree holding root systems. Maintain sufficient cover to prevent erosion without requiring planting. Roots of species listed in Attachment 7 shall be removed from the zone unless an erosion analysis has been performed by a qualified professional or Geologist indicating the need to retain the root systems. Geology reports affecting the fuel modification program shall be provided to the OCFA.

Attachment 5
SAMPLE CC&R MAINTENANCE LANGUAGE

It is recommended that the following language be included in the CC&Rs recorded for a common interest development: The duty of the homeowners association to perform "Fire Prevention Maintenance'(as defined below) for all Fuel Modification Zones and manufactured interior slopes within the development shall be included as an express obligation in the recorded CC&Rs for the development. Similarly, each Owner whose Lot (or Condominium) is subject to Fuel Modification Zone restrictions (e.g., non–combustible structure setback, etc.) shall be obligated to comply with such restrictions.

1. The OCFA will be designated as a third party beneficiary of a homeowner association's duty to perform 'Fire Prevention Maintenance'(as defined below) for all portions of the Association Property (or Common Area) that constitute fuel modification zones and designated interior/manufactured slopes to be maintained by the homeowners' association, and of any Owner's duty to comply with any fuel modification zone restrictions applicable to their lot (or condominium). Additionally, OCFA shall have the right, but not the obligation, to enforce the homeowners association's duty to perform such Fire Prevention Maintenance, and to enforce compliance by any owner with any fuel Modification zone restrictions applicable to their lot (or Condominium). In furtherance of such right the OCFA shall be entitled to recover its costs of suit, including its actual attorneys fees, if it prevails in an enforcement action against a homeowners' association and/or an individual owner. (A sample third party beneficiary provision to be incorporated into the CC&Rs is attached hereto as Addendum "1").

2. As used herein, "Fire Prevention Maintenance" shall mean the following:

(i) All portions of the Association Property (or Common Area) that constitute fuel modification zones or designated interior/manufactured slopes shall be regularly maintained by the homeowners association on a year–round basis in accordance with the fuel modification plan on file with the property manager for the development.

(ii) The irrigation system for fuel modification zones or designated interior/manufactured slopes shall be kept in good condition and proper working order at all times. The irrigation system shall not be turned off except for necessary repairs and maintenance.

CONCEPTUAL FUEL MODIFICATION PLAN

ESPERANZA HILLS - OPTION 1

YORBA LINDA, CALIFORNIA

LAMB ARCHITECTS
7114 EAST STETSON DRIVE SUITE 350, SCOTTSDALE, AZ 85251

SCALE: 1" = 200'-0"

0 200 400 600 800

NORTH

SUMMERS/MURPHY & PARTNERS, INC.
34787 PACIFIC COAST HIGHWAY, SUITE 200
DANA POINT, CALIFORNIA 92629 (949) 443-1446
LANDSCAPE ARCHITECTS

DATE: 11/15/2012

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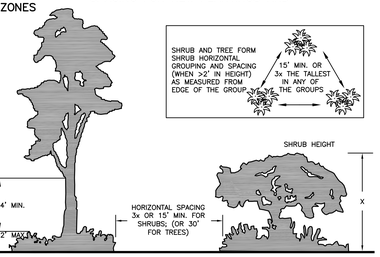
APPENDIX D

Option 2 and 2A Conceptual Fuel Modification Plan

ATTACHMENT 6: TREE AND TREE-FPRM SHRUB PRUNING AND SPACING FOR NEW PLANTINGS AND THINNING ZONES



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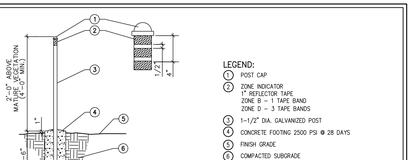
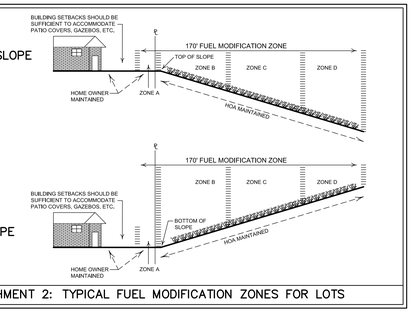


ATTACHMENT 4: IDENTIFICATION MARKER DETAIL



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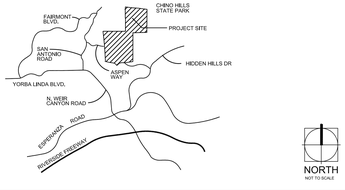

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There is no existing federally protected animal or bird habitat within the fuel modification areas we are proposing. There is no restriction regarding the dates of plant density thinning throughout the year. Maintenance is required in the late spring and early fall of each year. The project Landscape Architect has researched the soil and steepness of the slopes and there are no Geological issues preventing the required maintenance to be performed.

FUEL MODIFICATION LEGEND

- ZONE A (FLAT) – NON-COMBUSTIBLE CONSTRUCTION
- ZONE B – WET ZONE (100% REMOVAL NATIVE SHRUBS)
- ZONE C – DRY ZONE (50% THINNING NATIVE SHRUBS)
- ZONE D – DRY ZONE (30% THINNING NATIVE SHRUBS)
- SHADED FUEL BREAK ZONE — ALL VEGETATION IN THIS ZONE TO BE CUT DOWN TO GRADE AND MAINTAINED AS A FUEL BREAK AS REQUIRED BY OCFA
- NON-NATIVE VEGETATION REMOVAL ZONE — ALL NON-NATIVE VEGETATION IN THIS ZONE OF NATURAL OPEN SPACE TO BE REMOVED
- VEGETATION MANAGEMENT ZONE — ALL VEGETATION IN THIS ZONE TO BE IRRIGATED AND MAINTAINED AS REQUIRED BY OCFA

SYMBOL LEGEND

- FIRE ACCESS POINT (A 5' NON-COMBUSTIBLE TUBULAR STEEL GATE) 500' MINIMUM DISTANCE BETWEEN FUEL MODIFICATION ACCESS POINTS
- FUEL MODIFICATION ZONE MARKER
- PERMANENT IDENTIFICATION MARKERS SHALL BE CONSTRUCTED TO IDENTIFY THE LIMITS OF APPLICABLE FUEL MODIFICATION ZONES. MARKER DESIGN SHALL BE 2" dia. X 8'-0" LONG GALVANIZED PIPE, EMBED MINIMUM 2'-6" INTO SOLID GROUND. STENCIL TOP 6" WITH A LETTER 'B', 'C' OR 'D'. EXPOSE PIPE 2'-0" ABOVE VEGETATION MINIMUM. SEE DETAIL ON LEFT.
- ROAD CONNECTS TO EXISTING CHINO HILLS STATE PARK ROAD AT THIS POINT
- NATURAL OPEN SPACE
- IRRIGATED LANDSCAPE SLOPES/ENTRY/MEDIANS
- IRRIGATED LANDSCAPE PARKS/OPEN SPACE
- 242 — LOT NUMBER
- PROPERTY BOUNDARY

FUEL MODIFICATION MAINTENANCE NOTES

Zone A –Irrigated Structure Setback Zone (See Attachment 2)

The purpose of the setback zone is to provide a defensible space for fire suppression forces and to protect structures from radiant and convective heat. Zone A shall not be less than a 20–foot minimum width. The entire zone is to be located on a level, graded area at the top or base of the slope.

If Zone A is located within the lot containing the protected structure and another entity is maintaining the B–D zones, it shall be located at the most distal level 20 feet prior to the beginning of the slope. If Zone A is located outside of the lot containing the protected structure, it shall begin at the lot property line. The latter condition is preferred as it allows for combustible construction within privately owned individual lots. Typically, Zone A will not be approved when proposed more than 1 O feet from the protected structure. Zone A may incorporate trails, roadways, and other level noncombustible surfaces that create defensible space for fire crews heat reduction between the protected structure and the fire.

Zone A – Specific Maintenance Requirements
A. Automatic irrigation systems to maintain healthy vegetation with high moisture content and be regularly irrigated.

B. Pruning of foliage to reduce fuel load, maintain vertical continuity, and removal of plant litter and dead wood in accordance with Attachment 6.

C. Complete removal of undesirable plant species (See Attachment 7). There is also minimal allowance for retention of selected native vegetation.

D. Plants in this zone shall be highly fire resistant and selected from the Attachment B for the setback zone and given geographical area. (Refer to Attachment B and Section 3).

E. Tree species within Zone A are not allowed within 1 O feet of combustible structures (measured from the edge of a full growth crown).

F. Maintenance includes thinning and removal of over–growth, replacement of dead/dying fire resistant plantings, and maintenance of the operation of the irrigation system.

G. Devices that burn solid fuels are not permitted in any fuel modification zone.

H. No combustible construction shall be allowed within Zone A.

Zone B – Irrigated Zone
This portion of fuel modification consists of irrigated landscaping. This irrigated zone adjoins Zone A, and is a minimum of 50 feet in width and may be increased as conditions warrant. The plans must delineate that portion of the fuel modification area that will be permanently and regularly irrigated. The landscape architect shall select plant species, design an irrigation system, and design a maintenance program which sensitively addresses water conservation practices and includes methods of erosion control to protect against slope failure. All irrigation shall be kept a minimum of 20 feet from the drip line of any existing native Quercus (oak) species.

Zone B shall be cleared of all undesirable plant species, irrigated, and planted with species from Attachment B. Exceptions to save desirable species may be submitted for approval by the OCF A on a site–specific basis.

Zone B – Specific Maintenance Requirements
A. Groundcover shall be installed and maintained at a height not to exceed 2 feet.

B. In order to maintain proper coverage, native grasses shall be allowed to go to seed. Native grasses shall be cut after annual seeding. Cut heights shall be approximately 4 –inches.

C. Apply irrigation rates to maintain healthy vegetation with high moisture content based on plant species specific needs.

D. All plant species designed for Zone B shall be selected from Attachment 8. Existing fuel modification maintenance programs are limited to the plants listed on the approved plans unless a revision is requested. Planting and maintenance shall be in accordance with planting restrictions from Attachments 6, 7, and 8.

E. Groups of trees, tree–form shrubs, and shrubs that naturally exceed 2 feet in height shall be vertically pruned, and horizontally spaced in accordance with Attachment 6.

F. Removal of dead and dying vegetation and undesirable plant species from Attachment 7.

G. Devices that burn solid fuels are not permitted in any fuel modification zone.

H. Combustible construction is not allowed within Zone B.

Zones C & D –Thinning Zones – Non–Irrigated

Zone C is 50 feet in width and requires horizontal and vertical spacing of plant groups in accordance with Attachment 6 and removal of all dead and dying vegetation and undesirable species from Attachment 7. Minimum thinning percentage of plant removal is 50%.

Zone D is 50 feet in width and requires horizontal and vertical spacing of plant groups in accordance with Attachment 6 and removal of all dead and dying vegetation and undesirable species from Attachment 7. Minimum thinning percentage of plant removal is 30%.

Thinning zones reduce the fuel load of a wildland area adjacent to the irrigated zones and urban development, reducing heat and ember production from wildland fires. Thinning zones adjoin Zone B and can extend 100 feet or more into wildland areas. The total percentage of vegetation to be removed is determined by many factors, including topography, exposure, vegetation type, and vegetation density. Sometimes a greater thinning percentage than the minimum may be temporarily needed to meet spacing requirements from Attachment for the removal of dead and undesirable species.

Zone C and D – Specific Maintenance Requirements
A. Removal of dead and dying vegetation and undesirable plant species from Attachment 7.

B. In order to maintain proper coverage, native grasses shall be allowed to go to seed. Native grasses shall be cut after annual seeding. Cut heights shall be approximately 4 inches.

C. Groups of trees, tree–form shrubs, and shrubs that naturally exceed 4 feet in height shall be vertically pruned, and horizontally spaced in accordance with Attachment 6.

D. Plants species introduced into Zone C or D shall be selected from Attachment 8. Existing fuel modification maintenance programs are limited to the plants listed on the approved plans unless a revision is requested. Planting and maintenance shall be in accordance with planting restrictions from Attachments 7 and 8. (See Section 3)

E. Reduce fuel loading by reducing fuel in each remaining shrub or tree without substantial decrease in the canopy cover or removal of tree holding root systems. Maintain sufficient cover to prevent erosion without requiring planting. Roots of species listed in Attachment 7 shall be removed from the zone unless an erosion analysis has been performed by a qualified professional or Geologist indicating the need to retain the root systems. Geology reports affecting the fuel modification program shall be provided to the OCFA.

Attachment 5
SAMPLE CC&R MAINTENANCE LANGUAGE

It is recommended that the following language be included in the CC&Rs recorded for a common interest development: The duty of the homeowners association to perform 'Fire Prevention Maintenance' (as defined below) for all Fuel Modification Zones and manufactured interior slopes within the development shall be included as an express obligation in the recorded CC&Rs for the development. Similarly, each Owner whose Lot (or Condominium) is subject to Fuel Modification Zone restrictions (e.g., non–combustible structure setback, etc.) shall be obligated to comply with such restrictions.

1. The OCFA will be designated as a third party beneficiary of a homeowner association's duty to perform 'Fire Prevention Maintenance' (as defined below) for all portions of the Association Property (or Common Area) that constitute fuel modification zones and designated interior/manufactured slopes to be maintained by the homeowners association, and of any Owner's duty to comply with any fuel modification zone restrictions applicable to their lot (or condominium). Additionally, OCFA shall have the right, but not the obligation, to enforce the homeowners association's duty to perform such Fire Prevention Maintenance, and to enforce compliance by any owner with any fuel Modification zone restrictions applicable to their lot (or Condominium). In furtherance of such right the OCFA shall be entitled to recover its costs of suit, including its actual attorneys fees, if it prevails in an enforcement action against a homeowners association and/or an individual owner. (A sample third party beneficiary provision to be incorporated into the CC&Rs is attached hereto as Addendum "1").

2. As used herein, "Fire Prevention Maintenance" shall mean the following:

(i) All portions of the Association Property (or Common Area) that constitute fuel modification zones or designated interior/manufactured slopes shall be regularly maintained by the homeowners association on a year–round basis in accordance with the fuel modification plan on file with the property manager for the development.

(ii) The irrigation system for fuel modification zones or designated interior/manufactured slopes shall be kept in good condition and proper working order at all times. The irrigation system shall not be turned off except for necessary repairs and maintenance.

CONCEPTUAL FUEL MODIFICATION PLAN

ESPERANZA HILLS - OPTION 2

ORANGE COUNTY, CALIFORNIA

LAMB ARCHITECTS
7114 EAST STETSON DRIVE SUITE 350, SCOTTSDALE, AZ 85251

SCALE: 1" = 200'-0"

0 200 400 600 800

NORTH

SUMMERS/MURPHY & PARTNERS, INC.
34787 PACIFIC COAST HIGHWAY, SUITE 200
DANA POINT, CALIFORNIA 92629 (949) 443-1446
LANDSCAPE ARCHITECTS

DATE: 11/15/2012

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APPENDIX E

Approved Fuel Modification Zone Plant List

Attachment 7

UNDESIRABLE PLANT SPECIES (Target Species)

Certain plants are considered to be undesirable in the landscape due to characteristics that make them highly flammable. These characteristics can be either physical or chemical. Physical properties that would contribute to high flammability include large amounts of dead material retained within the plant, rough or peeling bark, and the production of copious amounts of litter. Chemical properties include the presence of volatile substances such as oils, resins, wax, and pitch. Certain native plants are notorious for containing these volatile substances.

Plants with these characteristics shall not be planted in any of the fuel modification zones. Should these species already exist within these areas, they shall be removed because of the potential threat they pose to any structures. They are referred to as target species since their complete removal is a critical part of hazard reduction. These fire-prone plant species include (but not limited to):

FIRE PRONE PLANT SPECIES (MANDATORY REMOVAL)

Botanical Name	Common Name
Cynara Cardunculus	Artichoke Thistle
Ricinus Communis	Castor Bean Plant
Cirsium Vulgare	Wild Artichoke
Brassica Nigra	Black Mustard
Silybum Marianum	Milk Thistle
Sacsola Austails	Russian Thistle/Tumblewood
Nicotiana Bigelevil	Indian Tobacco
Nicotiana Glauca	Tree Tobacco
Lactuca Serriola	Prickly Lettuce
Conyza Canadensis	Horseweed
Heterothaca Grandiflora	Telegraph Plant
Anthemix Cotula	Mayweed
Urtica Urens	Burning Nettle
Cardaria Draba	Noary Cress, Perennial Peppergrass
Brassica Rapa	Wild Turnip, Yellow Mustard, Field Mustard
Adenostoma Fasciculatum	Chamise
Adenostoma Sparsifolium	Red Shanks
Cortaderia Selloana	Pampas Grass
Artemisia Californica	California Sagebrush
Eriogonum Fasciculatum	Common Buckwheat
Salvia Mellifera	Black Sage

Ornamental:

Cortaderia	Pampas Grass
Cupressus sp	Cypress
Eucalyptus sp	Eucalyptus
Juniperus sp	Juniper
Pinus sp	Pine

Attachment 8

FUEL MODIFICATION ZONE PLANT LIST

(Note: Legend can be found on page 35)

	Code	Botanical Name	Common Name	Plant Form
1.	W	Abelia x grandiflora	Glossy Abelia	Shrub
2.	n	Acacia redolens desert carpet	Desert Carpet	Shrub
3.	o	Acer macrophyllum	Big Leaf Maple	Tree
4.	X	Achillea millefolium	Common Yarrow	Low Shrub
5.	W	Achillea tomentosa	Woolly Yarrow	Low Shrub
6.	X	Aeonium decorum	Aeonium	Ground cover
7.	X	Aeonium simsii	no common name	Ground cover
8.	W	Agave attenuata	Century Plant	Succulent
9.	W	Agave shawii	Shaw's Century Plant	Succulent
10.	N	Agave victoriae-reginae	no common name	Ground Cover
11.	X	Ajuga reptans	Carpet Bugle	Ground Cover
12.	W	Alnus cordata	Italian Alder	Tree
13.	o	Alnus rhombifolia	White Alder	Tree
14.	N	Aloe arborescens	Tree Aloe	Shrub
15.	N	Aloe aristata	no common name	Ground Cover
16.	N	Aloe brevifoli	no common name	Ground Cover
17.	W	Aloe Vera	Medicinal Aloe	Succulent
18.	W	Alogyne huegeii	Blue Hibiscus	Shrub
19.	o	Ambrosia chammissonis	Beach Bur-Sage	Perennial
20.	o	Amorpha fruticosa	Western False Indigobush	Shrub
21.	W	Anigozanthus flavidus	Kangaroo Paw	Perennial/accent

22.	o	Antirrhinum nuttalianum ssp.	no common name	Subshrub
23.	X	Aptenia cordifolia x 'Red Apple'	Red Apple Aptenia	Ground cover
24.	W	Arbutus unedo	Strawberry Tree	Tree
25.	W	Arctostaphylos 'Pacific Mist'	Pacific Mist Manzanita	Ground Cover
26.	W	Arctostaphylos edmundsii	Little Sur Manzanita	Ground Cover
27.	o	Arctostaphylos glandulosa ssp.	Eastwood Manzanita	Shrub
28.	W	Arctostaphylos hookeri 'Monterey Carpet'	Monterey Carpet Manzanita	Low Shrub
29.	N	Arctostaphylos pungens	no common name	Shrub
30.	N	Arctostaphylos refugioensis	Refugio Manzanita	Shrub
31.	W	Arctostaphylos uva-ursi	Bearberry	Ground Cover
32.	W	Arctostaphylos x 'Greensphere'	Greensphere Manzanita	Shrub
33.	N	Artemisia caucasica	Caucasian Artesmisia	Ground Cover
34.	X	Artemisia pycnocephala	Beach Sagewort	Perennial
35.	X	Atriplex canescens	Four-Wing Saltbush	Shrub
36.	X	Atriplex lentiformis ssp. breweri	Brewer Saltbush	Shrub
37.	o	Baccharis emoyi	Emory Baccharis	Shrub
38.	W o	Bacharis pilularis ssp. Consanguinea	Chaparral Bloom	Shrub
39.	X	Baccharis pilularis var. pilularis	Twin Peaks #2'	Ground Cover
40.	o	Baccharis salicifolia	Mulefat	Shrub
41.	N	Baileya Multiradiata	Desert Marigold	Ground Cover
42.	W	Beaucarnea recurvata	Bottle Palm	Shrub/Small Tree
43.	N n	Bougainvillea spectabilis	Bougainvillea	Shrub
44.	N n	Brahea armata	Mexican Blue Palm/Blue Hesper Palm	Palm
45.	N n	Brahea brandegeei	San Jose Hesper Palm	Palm
46.	N n	Brahea edulis	Guadalupe Palm	Palm
47.	o	Brickellia californica	no common name	Subshrub

48.	W o	Bromus carinatus	California Brome	Grass
49.	o	Camissonia cheiranthifiloa	Beach Evening Primrose	Perennial Shrub
50.	N	Carissa macrocarpa	Green Carpet Natal Plum	Ground Cover/Shrub
51.	X	Carpobrotus chilensis	Sea Fig Ice Plant	Ground Cover
52.	W	Ceanothus gloriosus 'Point Reyes'	Point Reyes Ceanothus	Shrub
53.	W	Ceanothus griseus 'Louis Edmunds'	Louis Edmunds Ceanothus	Shrub
54.	W	Ceanothus griseus horizontalis	Yankee Point	Ground Cover
55.	W	Ceanothus griseus var. horizontalis	Carmel Creeper Ceanothus	Shrub
56.	W	Ceanothus griseus var. horizontalis	Yankee Point Ceanothus	Shrub
57.	o	Ceanothus megarcarpus	Big Pod Ceanothus	Shrub
58.	W	Ceanothus prostratus	Squaw Carpet Ceanothus	Shrub
59.	o	Ceanothus spinosus	Green Bark Ceanothus	Shrub
60.	W	Ceanothus verrucosus	Wart-Stem Ceanothus	Shrub
61.	W	Cerastium tomentosum	Snow-in-Summer	Ground cover/Shrub
62.	W	Ceratonia siliqua	Carob	Tree
63.	W	Cercis occidentalis	Western Redbud	Shrub/Tree
64.	X	Chrysanthemum leucanthemum	Oxeye Daisy	Ground Cover
65.	W	Cistus Crispus	no common name	Ground Cover
66.	W	Cistus hybridus	White Rockrose	Shrub
67.	W	Cistus incanus	no common name	Shrub
68.	W	Cistus incanus ssp. Corsicus	no common name	Shrub
69.	W	Cistus salviifolius	Sageleaf Rockrose	Shrub
70.	W	Cistus x purpureus	Orchid Rockrose	Shrub
71.	W	Citrus species	Citrus	Tree
72.	o	Clarkia bottae	Showy Fairwell to Spring	Annual
73.	o	Cneoridium dumosum	Bushrue	Shrub

74.	o	Collinsia heterophyllia	Chinese Houses	Annual
75.	W o	Comarostaphylis diversifolia	Summer Holly	Shrub
76.	N	Convolvulus cneorum	Bush Morning Glory	Shrub
77.	W	Coprosma kirkii	Creeping Coprosma	Ground Cover/Shrub
78.	W	Coprosma pumila	Prostrate Coprosma	Low shrub
79.	o	Coreopsis californica	Califiornia Coreopsis	Annual
80.	W	Coreopsis lanceolata	Coreopsis	Ground Cover
81.	N	Corea pulchella	Australian Fuscia	Ground Cover
82.	W	Cotoneaster buxifolius	no common name	Shrub
83.	W	Cotoneaster congestus ‘Likiang’	Likiang Cotoneaster	Ground Cover/Vine
84.	W	Cotoneaster aprneyi	no common name	Shrub
85.	X	Crassula lactea	no common name	Ground Cover
86.	X	Crassula multicava	no common name	Ground Cover
87.	X	Crassula ovata	Jade Tree	Shrub
88.	X	Crassula tetragona	no common name	Ground Cover
89.	W o	Croton californicus	California Croton	Ground Cover
90.	X	Delosperma ‘alba’	White trailing Ice Plant	Ground Cover
91.	o	Dendromecon rigida	Bush Poppy	Shrub
92.	o	Dichelostemma capitatum	Blue Dicks	Herb
93.	N	Distinctis buccinatoria	Blood-Red Trumpet Vine	Vine/Climbing vine
94.	N	Dodonaea viscosa	Hopseed Bush	Shrub
95.	X	Drosanthemum floribundum	Rosea Ice Plant	Ground Cover
96.	X	Drosanthemum hispidum	no common name	Ground Cover
97.	X	Drosanthemum speciosus	Dewflower	Ground Cover
98.	o	Dudleya lanceolata	Lance-leaved Dudleya	Succulent
99.	o	Dudleya pulverulenta	Chalk Dudleya	Succulent

100.	W	Elaeagnus pungens	Silverberry	Shrub
101.	o	Encelia californica	California Encelia	Small Shrub
102.	o *	Epilobium canum [Zauschneria californica]	Hoary California Fuschia	Shrub
103.	o	Eriastrum Sapphirinum	Mojave Woolly Star	Annual
104.	N	Eriobotrya japonica	Loquat	Tree
105.	o	Eriodictycon crassifolium	Thick Leaf Yerba Santa	Shrub
106.	o	Eriodictycon trichocalyx	Yerba Santa	Shrub
107.	W o	Eriophyllum confertiflorum	no common name	Shrub
108.	W	Erythrina species	Coral Tree	Tree
109.	N	Escallonia species	Several varieties	Shrub
110.	W o	Eschscholzia californica	California Poppy	Flower
111.	X	Eschscholzia mexicana	Mexican Poppy	Herb
112.	N	Euonymus fortunei	Winter Creeper Euonymus	Ground Cover
113.	N	Feijoa sellowiana	Pineapple Guava	Shrub/Tree
114.	N	Fragaria chiloensis	Wild Strawberry/Sand Strawberry	Ground Cover
115.	o	Frankenia salina	Alkali Heath	Ground Cover
116.	W	Fremontondendron californicum	California Flannelbush	Shrub
117.	X	Gaillardia x grandiflora	Blanketflower	Ground Cover
118.	W	Galvezia speciosa	Bush Snapdragon	Shrub
119.	W	Garrya ellipta	Silktassel	Shrub
120.	X	Gazania hybrids	South African Daisy	Ground Cover
121.	X	Gazania rigens leucolaena	Training Gazania	Ground Cover
122.	o	Gillia capitata	Globe Gilia	Perrenial
123.	W	Gilia leptantha	Showy Gilia	Perrenial
124.	W	Gilia tricolor	Bird’s Eyes	Perrenial
125.	W	Ginkgo biloba	Maidenhair Tree	Tree

126.	o	Gnaphalium californicum	California Everlasting	Annual
127.	W	Grewia occidentalis	Starflower	Shrub
128.	o	Grindelia stricta	Gum Plant	Ground Cover
129.	N n	Hakea suaveolens	Sweet Hakea	Shrub
130.	W	Hardenbergia comptoniana	Lilac Vine	Shrub
131.	N	Heliathemum muutabile	Sunrose	Ground Cover/Shrub
132.	o	Helianthemum scoparium	Rush Rose	Shrub
133.	o	Heliotropium curassavicum	Salt Heliotrope	Ground Cover
134.	X	Helix Canariensis	English Ivy	Ground Cover
135.	W	Hesperaloe parviflora	Red Yucca	Perennial
136.	o n	Heteromeles arbutifolia	Toyon	Shrub
137.	X	Hypericum calycimum	Aaron's Beard	Shrub
138.	N	Iberis sempervirens	Edging Candytuft	Ground Cover
139.	N	Iberis umbellatum	Globe Candytuft	Ground Cover
140.	o	Isocoma menziesii	Coastal Goldenbush	Small Shrub
141.	o	Isomeris arborea	Bladderpod	Shrub
142.	W	Iva hayesiana	Poverty Weed	Ground Cover
143.	N	Juglans californica	California Black Walnut	Tree
144.	o	Juncus acutus	Spiny Rush	Perrenial
145.	o	Keckiella antirrhinoides	Yellow Bush Penstemon	Subshrub
146.	o	Keckiella cordifolia	Heart Leaved Penstemon	Subshrub
147.	o	Keckiella ternata	Blue Stemmed Bush Penstemon	Subshrub
148.	W	Kniphofia uvaria	Red Hot Poker	Perennial
149.	W	Lagerstroemia indica	Crape Myrtle	Tree
150.	W	Lagunaria patersonii	Primrose Tree	Tree
151.	X	Lamprathus aurantiacus	Bush Ice Plant	Ground Cover

152.	X	Lampranthus filicaulis	Redondo Creeper	Ground Cover
153.	X	Lampranthus spectabilis	Trailing Ice Plant	Ground Cover
154.	W	Lantana camara cultivars	Yellow Sage	Shrub
155.	W	Lantana montevidensis	Trailing Lantana	Shrub
156.	o	Lasthenia californica	Dwarf Goldfields	Annual
157.	W	Lavandula dentata	French Lavender	Shrub
158.	W	Leptospermum laevigatum	Australian Tea Tree	Shrub
159.	W	Leucophyllum frutescens	Texas Ranger	Shrub
160.	o	Leymus condensatus	Giant Wild Rye	Large Grass
161.	N	Ligustrum japonicum	Texas privet	Shrub
162.	X	Limonium pectinatum	no common name	Ground Cover
163.	X	Limonium perezii	Sea Lavender	Shrub
164.	W n	Liquidambar styraciflua	American Sweet Gum	Tree
165.	W	Liriodendron tulipfera	Tulip Tree	Tree
166.	X	Lonicera japonica ‘Halliana’	Hall’s Japanese Honeysuckle	Vining Shrub
167.	o	Lonicera subspicata	Wild Honeysuckle	Vining Shrub
168.	X	Lotus corniculatus	Bird’s Foot Trefoil	Ground Cover
169.	o	Lotus hermannii	Northern Woolly Lotus	Perennial
170.	o	Lotus scoparius	Deerweed	Shrub
171.	W	Lupinus arizonicus	Desert Lupine	Annual
172.	W	Lupinus benthamii	Spider Lupine	Annual
173.	o	Lupinus bicolor	Sky Lupine	Flowering annual
174.	o	Lupinus sparsiflorus	Loosely Flowered Annual Lupine/Coulter’s Lupine	Annual
175.	W	Lyonothamnus floribundus ssp. Asplenifolius	Fernleaf Ironwood	Tree
176.	W	Macadamia integrifolia	Macadamia Nut	Tree
177.	W	Mahonia aquifolium ‘Golden Abundance’	Golden Abundance Oregon Grape	Shrub

178.	W	Mahonia nevenii	Nevin Mahonia	Shrub
179.	o	Malacothamnus fasciculatus	Chapparal Mallow	Shrub
180.	X	Malephora luteola	Training Ice Plant	Ground Cover
181.	W	Maytenus boaria	Mayten Tree	Tree
182.	W	Melaleuca nesophila	Pink Melaleuca	Shrub
183.	N	Metrosideros excelsus	New Zealand Christmas Tree	Tree
184.	o *	Mimulus species	Monkeyflower	Flower
185.	o	Mirabilis californica	Wishbone Bush	Perrenial
186.	N	Myoporum debile	no common name	Shrub
187.	W	Myoporum insulare	Boobyalla	Shrub
188.	W	Myoporum parvilfolium	no common name	Ground Cover
189.	W	Myoporum ‘Pacificum’	no common name	Ground Cover
190.	o	Nassella (stipa) lepidra	Foothill Needlegrass	Ground Cover
191.	o	Nassella (stipa) pulchra	Purple Needlegrass	Ground Cover
192.	o	Nemophilia menziesii	Baby Blue Eyes	Annual
193.	X	Nerium Oleander	Oleander	Shrub
194.	o	Nolina cismontana	Chapparal Nolina	Shrub
195.	N	Nolina species	Mexican Grasstree	Shrub
196.	W	Oenothera belandieri	Mexican Evening Primrose	Ground Cover
197.	N	Oenothera hookeri	California Evening Primrose	Flower
198.	W	Oenothera speciosa	Show Evening Primrose	Perrenial
199.	X	Ophiopogon japonicus	Mondo Grass	Ground Cover
200.	o *	Opuntia littoralis	Prickly Pear	Cactus
201.	o *	Opuntia oricola	Oracle Cactus	Cactus
202.	o *	Opuntia prolifera	Coast Cholla	Cactus
203.	W	Osmanthus fragrans	Sweet Olive	Shrub

204.	X	Osteospermum fruticosum	Training African Daisy	Ground Cover
205.	X	Parkinsonia aculeata	Mexican Palo Verde	Tree
206.	W	Pelargonium peltatum	Ivy Geranium	Ground Cover
207.	X	Penstemon species	Beard Tongue	Shrub
208.	W	Photinia fraseria	no common name	Shrub
209.	W	Pistacia chinesis	Chinese Pistache	Tree
210.	X	Pittosporum undulatum	Victorian Box	Tree
211.	o	Plantago erecta	California Plantain	Annual
212.	**	Plantago insularis	Woolly Plantain	Annual
213.	X	Plantago sempervirens	Evergreen Plantain	Ground Cover
214.	W	Plantanus racemosa	California Sycamore	Tree
215.	W	Plumbago auritulata	Plumbago Cape	Shrub
216.	o	Popolus fremontii	Western Cottonwood	Tree
217.	X	Portulacaria afra	Elephant's Food	Shrub
218.	o	Potentilla glandulosa	Sticky Cinquefoil	Subshrub
219.	X	Potentilla tabernaemontanii	Spring Cinquefoil	Ground Cover
220.	X	Prunus caroliniana	Carolina Cherry Laurel	Shrub/Tree
221.	o	Prunus ilicifolia ssp. Ilicifolia	Holly Leafed Cherry	Shrub
222.	X	Prunus lyonii	Catalina Cherry	Shrub/Tree
223.	N	Punica granatum	Pomegranate	Shrub/Tree
224.	W	Puya species	Puya	Succulent/Shrub
225.	W	Pyracantha species	Firethorn	Shrub
226.	o	Quercus agrifolia	Coast Live Oak	Tree
227.	o n *	Quercus berberdifolia	California Scrub Oak	Shrub
228.	o n *	Quercus dumosa	Coastal Scrub Oak	Shrub
229.	X	Quercus engelmannii	Engelmann Oak	Tree

230.	X	Quercus suber	Cork Oak	Tree
231.	X	Rhamnus alaternus	Italian Buckthorn	Shrub
232.	o	Rhamnus californica	California Coffee Berry	Shrub
233.	o	Rhamnus crocea	Redberry	Shrub
234.	o	Rhamnus crocea ssp. Ilicifolia	Hollyleaf Redberry	Shrub
235.	N	Rhaphiolepis species	Indian Hawthorne	Shrub
236.	o	Rhus integrifolia	Lemonade Berry	Shrub
237.	N	Rhus lancea	African Sumac	Tree
238.	o n	Rhus ovata	Sugarbush	Shrub
239.	o	Ribes aureum	Golden Currant	Shrub
240.	o	Ribes indecorum	White Flowering Currant	Shrub
241.	o	Ribes speciosum	Fuschia Flowering Goosebberry	Shrub
242.	W	Ribes viburnifolium	Evergreen currant	Shrub
243.	o *	Romneya coulteri	Matilija Poppy	Shrub
244.	X	Romneya coulteri ‘White Cloud’	White Cloud Matilija Poppy	Shrub
245.	W n	Rosmarinus officinalis	Rosemary	Shrub
246.	W n	Salvia greggii	Autums Sage	Shrub
247.	W n	Salvia sonomensis	Creeping Sage	Ground Cover
248.	o	Sambucus mexicana	Mexican Elderberry	Tree
249.	W	Santolina chamaecyparissus	Lavender Cotton	Ground Cover
250.	W	Santolina virens	Green Lavender Cotton	Shrub
251.	o	Satureja chandleri	San Miguel Savory	Perennial
252.	o	Scirpis scutus	Hard Stem Bulrush	Perennial
253.	o	Scirpus californicus	California Bulrush	Perennial
254.	X	Sedum acre	Goldmoss Sedum	Ground Cover
255.	X	Sedum album	Green Stonecrop	Ground Cover

256.	X	Sedum confusum	no common name	Ground Cover
257.	X	Sedum lineare	no common name	Ground Cover
258.	X	Sedum x rubrotinctum	Pork and Beans	Ground Cover
259.	X	Senecio serpens	no common name	Ground Cover
260.	o	Sisyrinchium bellum	Blue Eyed Grass	Ground Cover
261.	o	Solanum douglasii	Douglas Nightshade	Shrub
262.	o	Solanum xantii	Purple Nightshade	Perennial
263.	W	Stenicarpus sinuatus	Firewheel Tree	Tree
264.	W	Strelitzia nicolai	Giant Bird of Paradise	Perennial
265.	W	Strelitzia reginae	Bird of Paradise	Perennial
266.	o	Symphoricarpos mollis	Creeping Snowberry	Shrub
267.	W	Tecoma stans (Stenolobium stans)	Yellow Bells	Shrub/Small Tree
268.	X	Tecomaria capensis	Cape Honeysuckle	Ground Cover
269.	N	Teucarium chamedrys	Germander	Ground Cover
270.	N	Thymus serpyllum	Lemon Thyme	Ground Cover
271.	N	Trachelospermum jasminoides	Star Jasmine	Shrub
272.	o	Trichosstems lanatum	Woolly Blue Curls	Shrub
273.	X	Trifolium hirtum ‘Hyron’	Hyron Rose Clover	Ground Cover
274.	X	Trifolium fragerum ‘O’Connor’s’	O’Connor’s Legume	Ground Cover
275.	o	Umbellularia californica	California Laurel	Tree
276.	o	Verbena lasiostachys	Western Vervain	Perennial
277.	N	Verbena peruviana	no common name	Ground Cover
278.	X	Verbena species	Verbena	Ground Cover
279.	X	Vinca minor	Dwarf Periwinkle	Ground Cover
280.	o	Vitis girdiana	Desert Wild Grape	Vine
281.	X	Vulpia myuros ‘Zorro’	Zorro Annual Fescue	Grass

282.	W	Westringia fruticosa	no common name	Shrub
283.	W	Xannithorrhoea species	Grass Tree	Perennial accent/shrub
284.	W	Xylosma congestum	Shiny Xylosma	Shrub
285.	X	Yucca Species	Yucca	Shrub
286.	o	Yucca whipplei	Yucca	Shrub

Legend:

X = Plant species prohibited in wet and dry fuel modification zones adjacent to reserve lands. Acceptable on all other fuel modification locations and zones.

W = Plant species appropriate for use in wet fuel modification zones adjacent to reserve lands. Acceptable in all other wet and irrigated dry (manufactured slopes) fuel modification locations and zones.

o = Plant species native to Orange County. Acceptable in all fuel modification wet and dry zones in all locations.

N = Plant species acceptable on a limited basis (maximum 30% of the area) in wet fuel modification zones *adjacent to reserve lands*. Acceptable on all other fuel modification zones.

***** = If locally collected.

****** = Not native but can be used in all zones.

n = Plant species acceptable on a limited use basis. Refer to qualification requirements following plant palette.

Approved Plant Palette – Qualification Statements for Select Plant Species

2. Acacia redolens desert carpet: May be used in the upper ½ of the "B" fuel modification zone. The plants may be planted at 8-foot on center, maximum spacing in meandering zones not to exceed a mature width of 24 feet or a mature height of 24 inches.

43. Bougainvillea spectabilis (procumbent varieties): Procumbent to mounding varieties may be used in the mid "B" fuel modification zone. The plants may be planted in clusters at 6-foot on center spacing not to exceed eight plants per cluster. Mature spacing between individual plants or clusters shall be 30-foot minimum.

44. Brahea armata: Additional information may be required as directed by the OCFA.

45. Brahea brandegeel: Additional information may be required as directed by the OCFA.

46. Brahea edulis: May be used in upper and mid "B" fuel modification zone. The plants shall be used as single specimens with mature spacing between palms of 20-foot minimum.

129. Hakea suaveolens: May be used in the mid "B" fuel modification zone. The plants shall be used as single specimens with mature spacing between plants of 30-foot minimum.

136. Heteromeles arbutifolia: May be used in the mid to lower "B" fuel modification zone. The plants may be planted in clusters of up to 3 plants per cluster. Mature spacing between individual plants or clusters shall be 30-foot minimum.

164. Liquidambar styraciflua: May be used in the mid "B" fuel modification zone. The plant shall be used as single specimens with mature spacing between trees and 30-foot minimum.

227. Quercus berberdifolia: Additional information may be required as directed by the OCFA.

228. Quercus dumosa: May be used in the mid to lower "B" fuel modification zone. The plants may be planted in clusters of up to 3 plants per cluster. Mature spacing between individual plants or clusters shall be 30-foot minimum.

238. Rhus ovata: May be used in the mid to lower "B" fuel modification zone of inland areas only. The plants may be planted in clusters of up to 3 plants per cluster. Mature spacing between individual plants or clusters shall be 30-foot minimum.

245. Rosmarinus officinalis: Additional information may be required as directed by the OCFA.

246. Salvia greggii: Additional information may be required as directed by the OCFA.

247. Salvia sonomensis: May be used in the mid to upper "B" fuel modification zone. The plants may be planted in clusters of up to 3 plants per cluster. Mature spacing between individual plants or clusters shall be 15-foot minimum.

APPENDIX F

Esperanza Hills Community-Wide
Prohibited Plant List

APPENDIX F
Prohibited Plant List

Botanical Name	Common Name
Trees	
Abies species	Fir
Acacia species (numerous)	Acacia
Agonis juniperina	Juniper Myrtle
Araucaria species (A. heterophylla, A. araucana, A. bidwillii)	Araucaria (Norfolk Island Pine, Monkey Puzzle Tree, Bunya Bunya)
Callistemon species (C. citrinus, C. rosea, C. viminalis)	Bottlebrush (Lemon, Rose, Weeiping)
Calocedrus decurrens	Incense Cedar
Casuarina cunninghamiana	River She-Oak
Cedrus species (C. atlantica, C. deodara)	Cedar (Atlas, Deodar)
Chamaecyparis species (numerous)	False Cypress
Cinnamomum camphora	Camphor
Cryptomeria japonica	Japanese Cryptomeria
Cupressocyparis leylandii	Leyland Cypress
Cupressus species (C. fobesii, C. glabra, C. sempervirens,)	Cypress (Tecate, Arizona, Italian, others)
Eucalyptus species (numerous)	Eucalyptus
Juniperus species (numerous)	Juniper
Larix species (L. decidua, L. occidentalis, L. kaempferi)	Larch (European, Japanese, Western)
Leptospermum species (L. laevigatum, L. petersonii)	Tea Tree (Austrailian, Tea)
Lithocarpus densiflorus	Tan Oak
Melaleuca species (M. linariifolia, M. nesophylla, M. quinqenervia)	Melaleuca (Flaxleaf, Pink, Cajeput Tree)
Olea europea	Olive
Picea (numerous)	Spruce
Palm species (numerous)	Palm
Pinus species (P. brutia, P. canariensis, P. eldarica, P. halopensis, P. pinea, P. radiate, numerous others)	Pine (Calabrian, Canary Island, Mondell, Aleppo, Italian Stone, Monterey)
Platycladus orientalis	Oriental arborvitae
Podocarpus species (P. gracilior, P. macrophyllus, P. latifolius)	Fern Pine (Fern, Yew, Podocarpus)
Pseudotsuga menziesii	Douglas Fir
Schinus species (S. molle, S. terebenthifolius)	Pepper (California and Brazilian)
Tamarix species (T. Africana, T. apylla, T. chinensis, T. parviflora)	Tamarix (Tamarisk, Athel Tree, Salt Cedar, Tamarisk)
Taxodium species (T. ascendens, T. distichum, T. mucronatum)	Cypress (Pond, Bald, Monarch, Montezuma)

Botanical Name	Common Name
Taxus species (T. baccata, T. brevifolia, T. cuspidata)	Yew (English, Western, Japanese)
Thuja species (T. occidentalis, T. plicata)	Arborvitae/Red Cedar
Tsuga species (T. heterophylla, T. mertensiana)	Hemlock (Western, Mountain)
Groundcovers, Shrubs & Vines	
Acacia species	Acacia
Adenostoma fasciculatum	Chamise
Adenostoma sparsifolium	Red Shanks
Agropyron repens	Quackgrass
Anthemis cotula	Mayweed
Arbutus menziesii	Madrone
Arctostaphylos species	Manzanita
Arundo donax	Giant Reed
Artemesia species (A. abrotanium, A. absinthium, A. californica, A. caucasia, A. dracunulus, A. tridentate, A. pynocephala)	Sagebrush (Southernwood, Wormwood, California, Silver, True tarrangon, Big, Sandhill)
Atriplex species (numerous)	Saltbush
Auena fatua	Wild Oat
Baccharis pilularis	Coyote Bush
Bambusa species	Bamboo
Bougainvillea species	Bougainvillea
Brassica species (B. campestris, B. nigra, B. rapa)	Mustard (Field, Black, Yellow)
Bromus rubens	Foxtail, Red brome
Cardera draba	Noary Cress
Carpobrotus species	Ice Plant, Hottentot Fig
Castanopsis chrysophylla	Giant Chinkapin
Cirsium vulgare	Wild Artichoke
Conyza bonariensis	Horseweed
Coprosma pumila	Prostrate Coprosma
Cortaderia selloana	Pampas Grass
Cytisus scoparius	Scotch Broom
Dodonea viscose	Hopseed Bush
Eriodyctyon californicum	Yerba Santa
Eriogonum species (E. fasciculatum)	Buckwheat (California)
Fremontodendron species	Flannel Bush
Hedera species (H. canariensis, H. helix)	Ivy (Algerian, English)
Heterotheca grandiflora	Telegraph Plant

Botanical Name	Common Name
Hordeum leporinum	Wild barley
Juniperus species	Juniper
Lactuca serriola	Prickly Lettuce
Larix species (numerous)	Larch
Larrea tridentata	Creosote bush
Lolium multiflorum	Ryegrass
Lonicera japonica	Japanese Honeysuckle
Mahonia species	Mahonia
Mimulus aurantiacus	Sticky Monkeyflower
Miscanthus species	Eulalie Grass
Muehlenbergia species	Deer Grass
Nicotania species (N. bigelevil, N. glauca)	Tobacco (Indian, Tree)
Pennisetum setaceum	Fountain Grass
Perronskia Atriplicifloria	Russian Sage
Phoradendrom species	Mistletoe
Pickeringia montana	Chaparral Pea
Rhus species (R. diversiloba, R. laurina, R. lentii)	Sumac (Poison oak, Laurel, Pink Flowering)
Ricinus communis	Castor Bean
Rosmarinus species	Rosemary
Salvia species (numerous)	Sage
Sacsola austails	Russian Thistle
Solanium Xantii	Purple Nightshade (toxic)
Sylibum marianum	Milk Thistle
Thuja species	Arborvitae
Urtica urens	Burning Nettle
Vinca major	Periwnkle
Rhus Lentii	Pink Flowering Sumac

Notes:

1. For the purpose of using this list as a guide in selecting plant material, it is stipulated that all plant material will burn under various conditions.
2. The absence of a particular plant, shrub, groundcover, or tree, from this list does not necessarily mean it is fire resistive.
3. All vegetation used in Vegetation Management Zones and elsewhere in this development shall be subject to approval of the Fire Marshal.
4. Additional plants that are considered undesirable due to their invasiveness nature are detailed on the California Invasive Plant Council's Web site at www.cal-ipc.org/ip/inventory/index.php.
5. Landscape architects may submit proposals for use of certain vegetation on a project specific basis. They shall also submit justifications as to the fire resistivity of the proposed vegetation.

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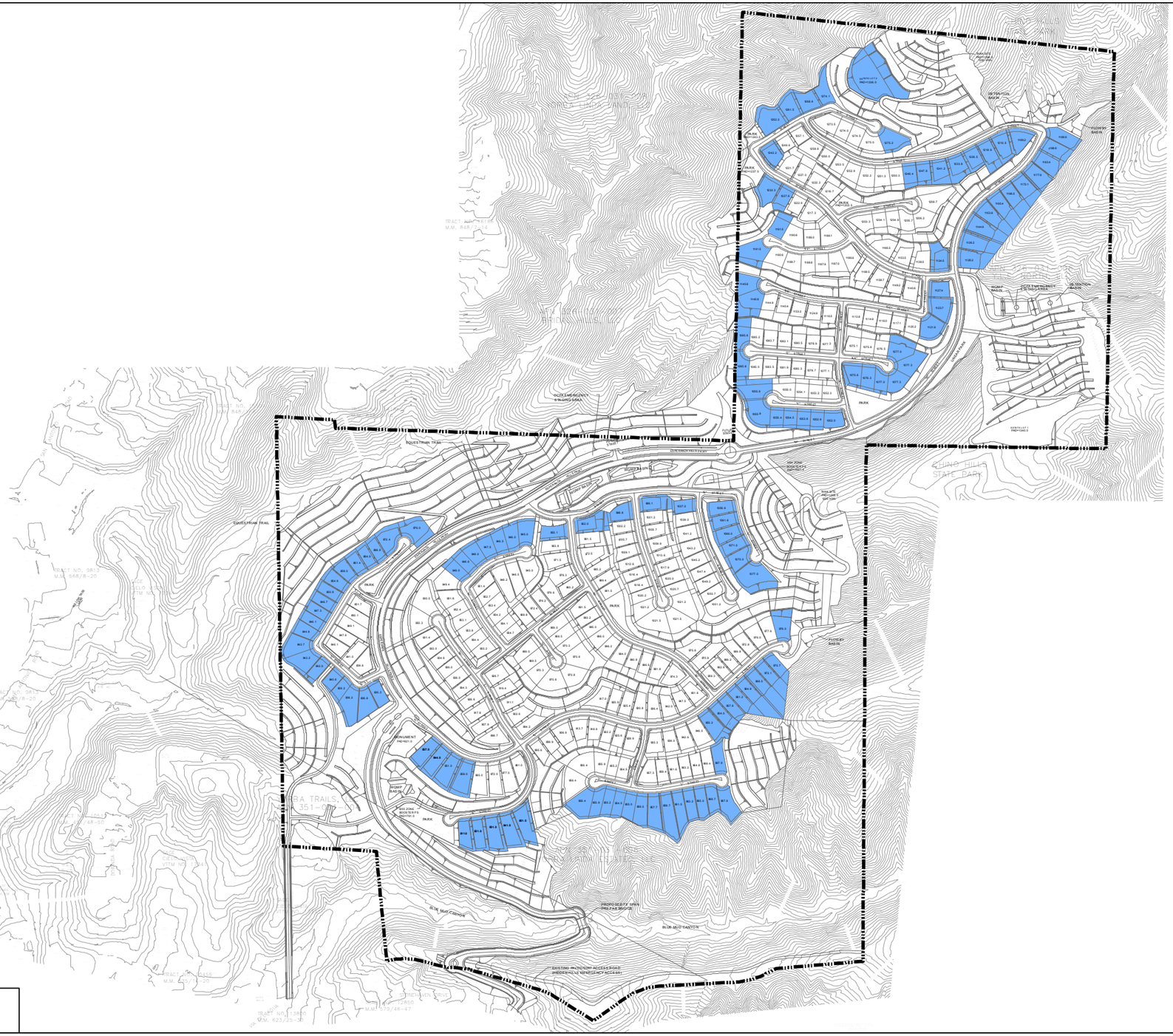
APPENDIX G

Esperanza Hills Priority Evacuation Lots – Option 1



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APPENDIX G

Priority Evacuation Lots - Option 1

ESPERANZA HILLS FIRE PROTECTION AND EMERGENCY EVACUATION PLAN

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APPENDIX H

Esperanza Hills Priority Evacuation Lots – Option 2

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APPENDIX H

Priority Evacuation Lots - Option 2

ESPERANZA HILLS FIRE PROTECTION AND EMERGENCY EVACUATION PLAN

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APPENDIX I

Esperanza Hills Priority Evacuation Lots - Option 2A

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APPENDIX I

Priority Evacuation Lots - Option 2A

ESPERANZA HILLS FIRE PROTECTION AND EMERGENCY EVACUATION PLAN

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