Appendix I –
Fire Protection Plan – Sanctuary Project

FIRE PROTECTION PLAN

Sanctuary

City of Encinitas

Project # MULTI-002610-2018, DR-002611-2018, SUB-002612-2018, ITRP-004018-2020, USE-003068-2019

January 21, 2020

Prepared for the City of Encinitas on behalf of the Owner,
Nuevo-Real Estate

Prepared by: _____

Sid Morel, President
Santa Margarita Consulting, LLC.

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EXECUTIVE SUMMARY

This Fire Protection Plan is for The Sanctuary development in the City of Encinitas. The Sanctuary proposes to subdivide one existing lot totaling 8.32 acres into 9 lots, one private street lot, and one open space lot, as well as associated site grading, construction of a new cul-de-sac street, drainage, utility, and landscaping improvements. The applicant proposes to build nine single family homes. The property is located just northwest of Rancho Santa Fe Road in the City of Encinitas.

The project is infill with typical Southern California vegetation, consisting of a mix of Chaparral, Coastal Sage, Non-native vegetation and Eucalyptus Woodland. A large portion of the existing parcel will remain protected open space and this Fire Protection Plan will incorporate wildfire resistant landscaping and building techniques that meet or exceed current codes.

CHAPTER 1 INTRODUCTION

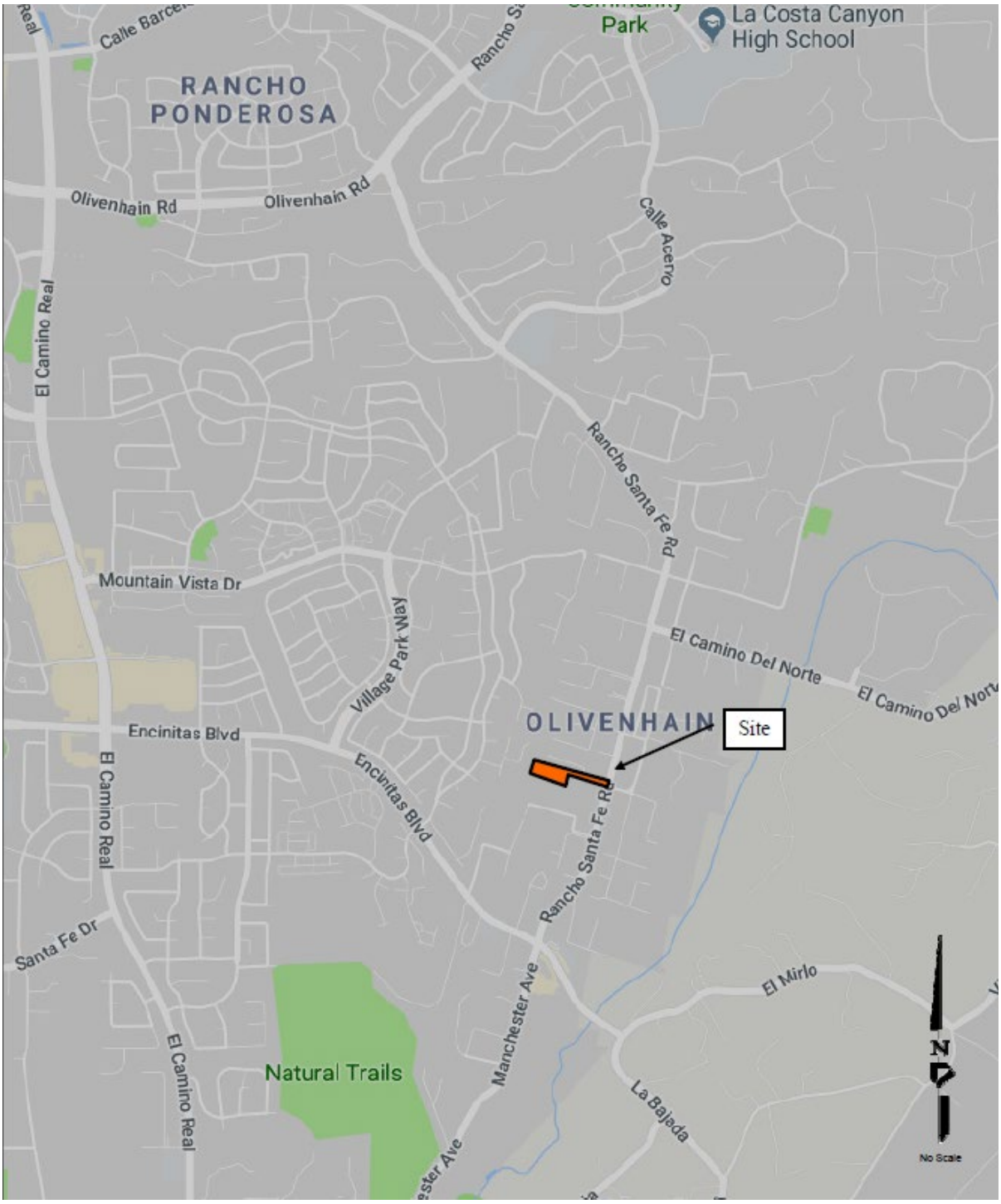
This Fire Protection Plan has been prepared for the Sanctuary project, APN 256-331-49. The purpose of the FPP is to assess the potential impacts resulting from wildland fire hazards and identify the measures necessary to adequately mitigate those impacts. As part of the assessment, the plan has considered the property location, topography, geology, combustible vegetation (fuel types), climatic conditions, and fire history. The plan addresses water supply, access, structural ignitability and fire resistive building features, fire protection systems and equipment. The plan identifies and prioritizes areas for hazardous fuel reduction treatments and recommends the types and methods of treatment that will protect one or more at risk communities and essential infrastructures. The plan recommends measures that property owners will take to reduce the probability of ignition of structures throughout the area addressed by the plan.

1.1 Project Location, Description and Environmental Setting

1.1.1 Project Location

The project is in the eastern-central part of the City of Encinitas. (See figure 1)

Figure 1


La Costa Canyon High School
Park
RANCHO PONDEROSA
Olivenhain Rd
Olivenhain Rd
Calle Acervo
El Camino Real
Rancho Santa Fe Rd
Mountain Vista Dr
Village Park Way
El Camino Del Norte
OLIVENHAIN
Site
Encinitas Blvd
Encinitas Blvd
El Camino Real
Rancho Santa Fe Rd
Santa Fe Dr
El Mirlo
Manchester Ave
Natural Trails
El Camino Real
La Bajada
No Scale

1.1.2 Project Description

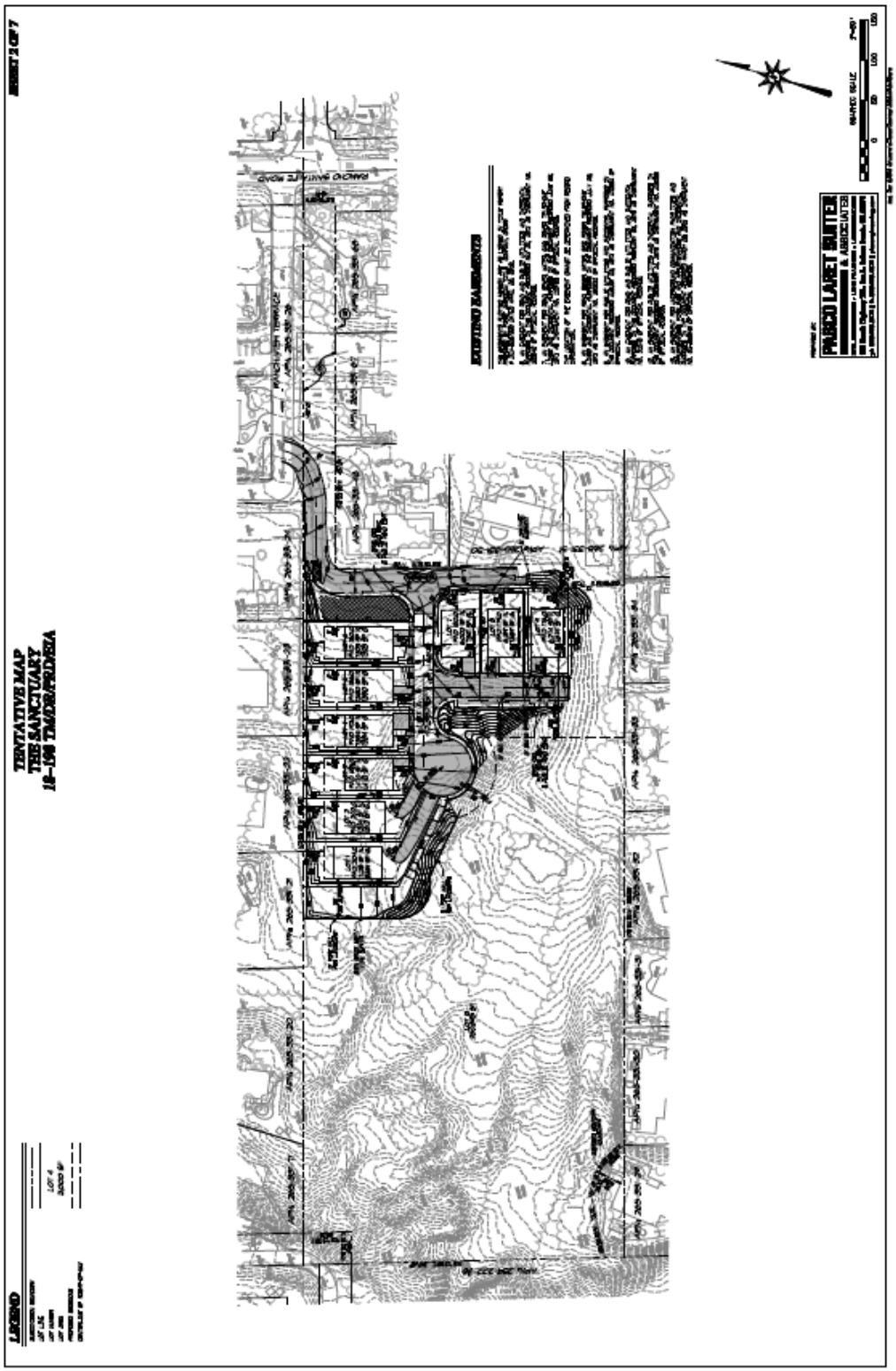
The Sanctuary proposes to subdivide one existing lot totaling 8.32 acres into 9 lots, one private street lot, and one open space lot, as well as associated site grading, construction of a new cul-de-sac street, drainage, utility, and landscaping improvements. Nine single family homes are proposed.

- 4.99 acres of the existing lot will remain as Open Space and the developed area will encompass 3.33 acres.
- Due to the heavy truck traffic, Sanctuary shall repair any damaged areas of the road and provide a full A/C width overlay along the existing portions of Ranch View Terrace, from the project's entry to Rancho Santa Fe Road.
- The project is zoned Rural Residential 2 (RR2)
- The Sanctuary shall be responsible for the construction of public improvements along the property frontage of Rancho Santa Fe Road, extension of a public sewer main to service the site and undergrounding of existing overhead utility power lines and appurtenances.
- The Sanctuary development shall improve the intersection of Rancho Santa Fe Road, Ranch View Terrace and 7th Street at all four corners shall be improved with ADA compliant pedestrian ramps and new cross walk striping.
- The Sanctuary development shall underground all overhead public utility lines, including electric, cable, telephone, fiber optic, and any other similar wire, and remove all existing utility poles and appurtenances along Rancho Santa Fe Road, Ranch View Terrace, the sideline of the property, as well as any utility lines running through the site or in an adjacent easement.

1.1.3 Environmental Setting

- January 22, 2020, site inspection.
- January 25, 2020, site inspection and pictures taken.
- Topography
- Fuel loads consist of an open space area with chaparral, coastal sage and Eucalyptus trees.
- The City of Encinitas has a relatively low wildland fire risk; however, this property is constrained by open space vegetation that must remain. This pocket of vegetation will always be a threat to burn. The building of The Sanctuary development, the grading of the pads and the fire-resistant homes, along with over 3 acres of Eucalyptus eliminated, creates a safer environment for the surrounding area.
- Weather: The weather is consistent Coastal San Diego County with highs typically reaching mid 80's in the summer and mild winters.
- The site is infill and surrounded by single family homes and large estate custom homes.

Figure 2: Site map with topo



Chapter 2. GUIDELINES FOR THE DETERMINATION OF SIGNIFICANCE.

A Fire Protection Plan evaluates the potential adverse environmental effects that the Sanctuary homes may have from wildland fire and proposes appropriate mitigation for any adverse impacts to ensure that this development does not unnecessarily expose people or structures to a significant risk of loss, injury or death in regard to wildland fire. The following guidelines for the determination of significance are used:

Does the project meet all applicable fire codes? No, Due to the open space requirements, the project cannot meet the 100 feet defensible space requirement. Mitigation is offered in the form of a masonry wall and fire-resistant landscaping.

Chapter 3. ANTICIPATED FIRE BEHAVIOR IN THE VICINITY

Development of the Sanctuary property will result in certain unavoidable impacts due to grading, construction, landscaping, and other associated changes in land-use. The removal of the Eucalyptus stand of trees will greatly reduce the threat of a wildland fire spreading embers. The existing open space / native chaparral will continue to be a threat to burn. The Behave Fire Modeling under worst case weather scenario results in a 28-foot flame length. The 50 feet of clearing and the masonry wall will provide defensible space like the 100-foot requirement. The additional access and fire hydrants will assist the fire department in attacking a fire. The building of the Sanctuary development will improve the overall safety of the immediate area around the site.

3.1 Fire History

May of 2014, San Diego County experienced severe Santa Ana wind conditions and numerous wildland fires broke out, testing firefighters and law enforcement. The closest fire to Encinitas was the Poinsettia Fire located in Carlsbad. In total the fire burned 400 acres, more than 240 structures and caused 12 million dollars in damage. (Peturske, 2019).

The October 2007, Witch Fire burned approximately 2,000,000 acres of land and destroyed 1,125 homes. The Fire occurred under Santa Ana wind conditions and burned a large portion of Rancho Santa Fe, nearly reaching Encinitas.

Chapter 4. ANALYSIS OF PROJECT EFFECTS

4.1 Adequate Emergency Services

The Encinitas Fire & Marine Safety Department provides a wide array of public safety services. These services include fire protection, emergency response, medical aid, fire prevention, disaster preparedness, search and rescue, lifeguard services and community education programs. (City of Encinitas, 2020)
The Department has 70 full-time employees and five divisions: Fire Operations and Support Services, Fire Administration, Loss Prevention and Planning (Fire Prevention), Disaster Preparedness and Marine Safety Services. The Department

operates six fire stations and is responsible for responding to a variety of emergencies in a 20 square mile area. In 2018, the Department's average response time for the city as a whole was 4 minutes and 49 seconds. The Insurance Services Organization (which rates fire departments based on the effectiveness of their response capabilities) gave the Department a rating of 2, which has resulted in lower homeowner's insurance premiums for Encinitas residents. (City of Encinitas, 2020)

Using Google Maps the travel time from Fire Station number 6 at 770 Rancho Santa Fe Road is approximately 2 minutes. The distance is .7 of a mile.

4.2 Fire Access

The access for The Sanctuary is from Rancho Santa Fe Road to Ranch View Terrace. The Sanctuary project has an easement to use Ranch View Terrace. The to be named access road shall be 24 feet wide and meet the 75,000-psi requirement. The 24-foot-wide sections will be marked "Fire Lane, No Parking" All radius's meet the 28 foot inside turning radius and a cul-de-sac with a 36-foot-wide radius will be installed. The to be named access road serving lots 6 – 9 has a fire department approved hammerhead incorporated in the intersection. Additional parking areas are provided along both access roads. (See figure 2)

4.3 Water

4.3.1 Water Supply

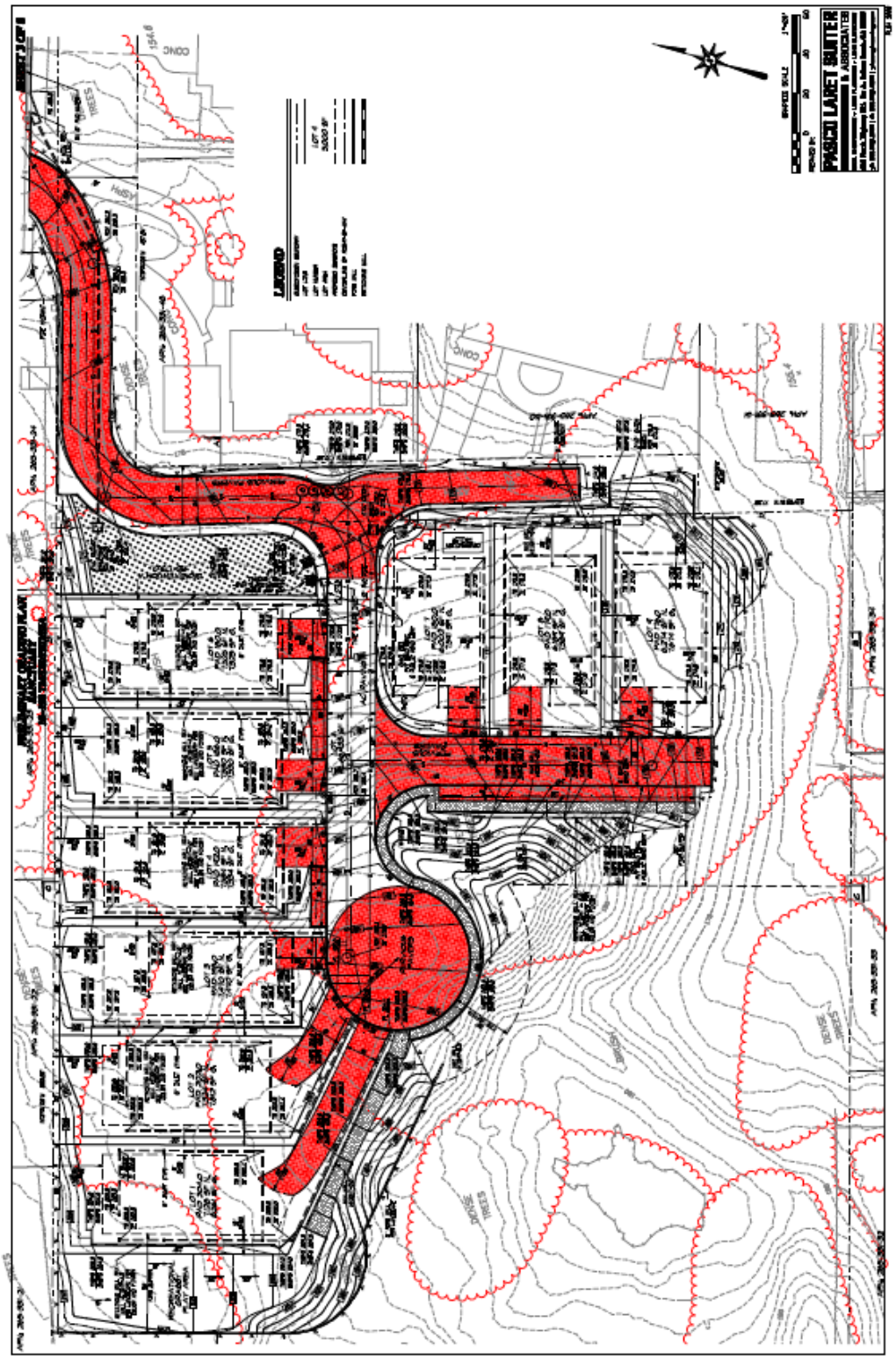
Water shall be provided by the Olivenhain Municipal Water District and shall meet the 2500 GPM in the main requirement. Two hydrants will be installed. One at the entrance to the development on the right side of the access road, as you would be driving into the development. This hydrant not only benefits the Sanctuary project but the residents off Ranch View Terrace as well. The other hydrant is located just prior to lot 5. This location allows the hydrant to serve all of the proposed homes in the Sanctuary development. (See figure 3)

4.4 Ignition-Resistant Construction and Fire Protection Systems

"All new structures shall comply with the ignition-resistive construction requirements: Wildland-Urban Interface areas of sections 701A-712A of the County Building Code. " (San Diego County Fire Marshals, 2017)

All new structures shall comply with NFPA 13 and have residential fire sprinklers installed. Plans shall be submitted to the City of Encinitas, Loss Prevention and Planning services.

Figure 3: Site Plan with Hydrants



4.5 Fire Fuel Assessment

The open-space lot contains unmanaged native and non-native fuels. Most of the native vegetation is Chaparral. Chaparral is the term that commonly describes a mix of native vegetation. There is a large stand of Eucalyptus trees and non-native grasses on the lot that will be removed to create the homes. This property is infill and is surrounded by existing homes. The homes have typical Southern California landscaping with Palms, ornamental vegetation and a few fruit trees. Development of the Sanctuary property will result in certain unavoidable impacts due to grading, construction, landscaping, and other associated changes in land-use. The removal of the Eucalyptus stand of trees will greatly reduce the threat of a wildland fire spreading embers throughout the neighborhood.

The Biological report states: Most of the site contains Southern Maritime Chaparral along with Coast White Ceanothus (Ceanothus verrucous), Chamise (Adenostoma fasciculatur), Del Mar Manzanita (Arctostaphylos glandulosa), and Mission Manzanita (Xylococcus bicolor), Spice Bush (Cneoridium dumosum), other native soft-woody and hard-woody shrubs. (Scheidt, 2019).

4.6 Fire Behavior Modeling

Wildland fire behavior calculations have been projected for the hazardous native vegetative fuels on the open space lot. These fire behavior models are based on worst case weather scenarios and accurately simulate what would happen during a wildfire. The worst-case Santa Ana fire would push the fire away from the Sanctuary development. A fire starting in the open space will produce flame lengths of 28 feet, with a spread rate of 228 chains per hour. (See Behave Appendix D)

4.7 Defensible Space and Vegetation Management

The 2017 County of San Diego Consolidated Fire Code, Section 4907.2 Fuel Modification:

Sec. 4907.2 Fuel modification. A fuel modification zone shall be required around every building that is designed primarily for human habitation or use or a building designed specifically to house farm animals. Decks, sheds, gazebos, freestanding open sided shade covers and similar accessory structures less than 250 square feet and 30 feet or more from a dwelling, and fences more than 5 feet from a dwelling, are not considered structures for the establishment of a fuel modification zone. A fuel modification zone shall comply with the following:

(a) When a building or structure in a hazardous fire area is located 100 feet or more from the property line, the person owning or occupying the building or structure shall maintain a fuel modification zone within 100 feet of the building or structure. The area within 50 feet of a building or structure shall be cleared of vegetation that is not fire resistant and re-planted with fire resistant plants. In the area 50 to 100 feet from a

building, all dead and dying shall be removed. Native vegetation may remain in this area provided that the vegetation is modified so that combustible vegetation does not occupy more than 50% of the square footage of this area. Weeds and annual grasses shall be maintained at a height not to exceed 6 inches. The chips from chipping of vegetation that is done on-site may remain if the chips are dispersed so they do not exceed 6 inches in depth. Trees may remain in both areas provided that the horizontal distance between crowns of adjacent trees and crowns of trees and structures is not less than 10 feet.

Sec. 4907.1.3 Structure setback from slope. Single-story structures shall be setback a minimum 15 feet horizontally from top of slope to the farthest projection from a roof. A single-story structure shall be less than 12 feet above grade. A two story structure shall be setback a minimum of 30 feet horizontally from top of slope to the farthest projection from a roof. Structures greater than two stories may require a greater setback when the slope is greater than 2 to 1.

(b) When a building or structure in a hazardous fire area is setback less than 100 feet from the property line, the person owning or occupying the building or structure shall meet the requirements in subsection (a) above, to the extent possible, in the area between the building or structure and the property line.
(c) The building official and the FAHJ may provide lists of prohibited and recommended plants.
(d) The fuel modification zone shall be located entirely on the subject property unless approved by the FAHJ. This required fuel modification zone may be reduced as allowed in subsection (b) above or increased as required by a fire protection plan.
(e) When the subject property contains an area designated to protect biological or other sensitive habitat or resource, no building or other structure requiring a fuel modification zone shall be located so as to extend the fuel modification zone into a protected area. (San Diego County Fire Marshals, 2017)

4.7.1 Defensible Space and Vegetation Management

- The fuel modification zone, (fire buffer) varies. (Figure 4 Fire Buffer) Lot 1 has 50 feet from the home to the edge of the open space. The property line / fence will be built out of Masonry or an approved fire-resistant product. Any gate connected to the house shall be ignition resistant. Wood fencing and gates will not be allowed. The Sanctuary will completely clear the 50-foot fire buffer and re-plant with ignition resistant landscaping. The landscaping plan shall meet the City of Encinitas Water Efficient landscaping requirements and will plant with plants from their ignition resistant landscaping list. (See appendix A)
- The fire buffer extends beyond the cul-de-sac providing 100 feet of fire buffer until lot 9. The fire buffer area will be common area to the HOA and landscaped to meet the City's Water Efficient landscaping, using ignition resistant plants.
- To ensure the fire buffer, common areas and front yards are kept in a healthy fire-resistant manner, the HOA will have a landscaping company maintain these areas.

4.8 Cumulative Impact Analysis

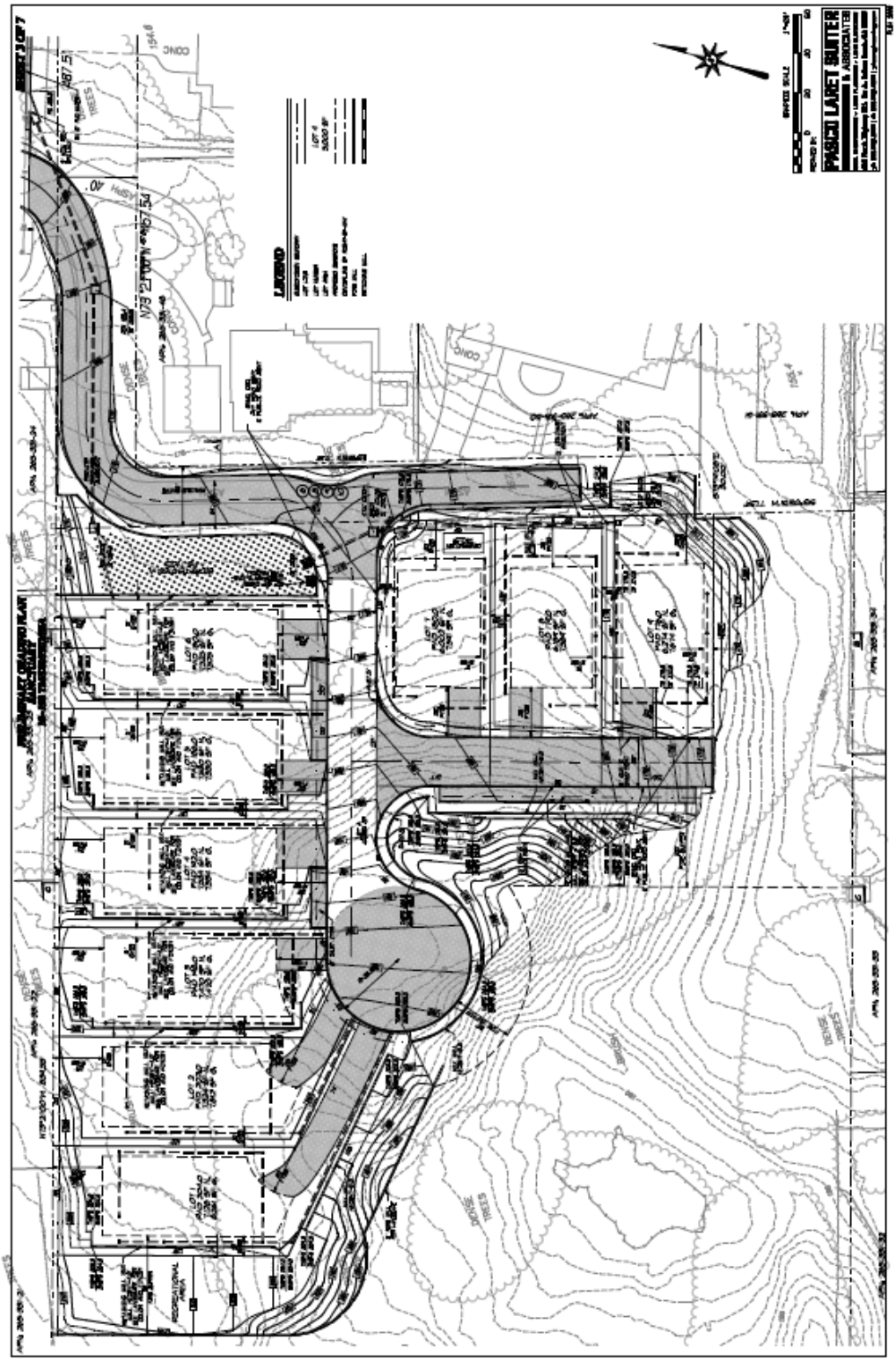
The Sanctuary development has significant off-site improvements that will enhance the surrounding area. These improvements include construction of public improvements along the property frontage of Rancho Santa Fe road, extension of a public sewer main to service the site and undergrounding of existing overhead utility power lines and appurtenances. The intersection of Rancho Santa Road, Ranch View Terrace and 7th street shall be improved with ADA compliant pedestrian ramps and new cross walk striping. The Sanctuary development shall underground all overhead public utility lines, including electric, cable, telephone, fiber optic, and any other similar wire, and remove all existing utility poles and appurtenances along Rancho Santa Fe Road, Ranch View Terrace, the sideline of the property, as well as any utility lines running through the site or in an adjacent easement.

The nine homes will not significantly impact the fire departments call volumes nor does the location create a response time issue. The off-site public improvements along with the removal of nearly 4 acres of flammable vegetation create a much safer environment for the surrounding area.

Chapter 5. MITIGATION MEASURES AND DESIGN CONSIDERATIONS

Throughout Southern California there are numerous pockets of Open Space / native vegetation that will always be a fire problem. The Sanctuary development is an example of a development that is built with the threat of wildfire as a guide. The Sanctuary development proposes masonry walls, fences and restrictive landscaping as mitigation for the portion of the project that does not meet the 100-foot defensible space. The developed area is infill and the open space resides to the west of the homes. This western alignment of the open space to the homes, eliminates the development from being threatened from a Santa Ana wind driven fire starting in the open space. The Sanctuary development will also provide fire hydrants and access that will assist the fire department in putting out a fire in the open space. The building of the Sanctuary project is a great example of how to meet the existing codes and improve the overall safety of the surrounding community.

Figure 4: Fire Buffer



Chapter 6. CONCLUSION

This fire protection plan demonstrates compliance with the applicable regulations. It will ensure adequate compliance with codes/regulations and significance standards, including required fuel modifications and construction methods using fire resistive materials. In addition, it can be incorporated by reference into the project's Final Conditions of Approval and enforced through each proposed structure's Certificate of Occupancy Conditions. The amount of defensible space on-site, the ignition resistant buildings, ignition resistant landscaping and the masonry walls will provide improved safety to the community.

Chapter 7. LIST OF PREPARERS AND PERSONS AND ORGANIZATIONS CONTACTED

Persons contacted:

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Santa Margarita Consulting, LLC	Nuevo Real Estate
Sid Morel	Udi Melamed
Signature	Signature
President	President
Title	Title

References

Andrews, Patricia L. et al. (2013). Behave Fire Modeling System.

City of Encinitas. (2020, January 25). *The City of Encinitas .* Retrieved from The City of Encinitas : https://encinitasca.gov/Government/Departments/Public-Safety

Peturske, S. (2019, May 9). Five Years Later, Carlsbad Officials recall Poinsettia Fire . Carlsbad , CA, United States .

San Diego County Fire Marshals. (2017). *County of San Diego 2017 Consolidated Fire Code .* San Diego: San Diego County Planning and Development Services .

Scheidt, V. N. (2019). *Biology Field Study .* San Diego: Vincent N. Scheidt.

APPENDIX A
INVASIVE SPECIES

BOTANICAL NAME	COMMON NAME
Acacia baileyana	Bailey Acacia
Acacia cyclops	Coastal Wattle
Acacia dealbata	Silver Wattle
Acacia longifolia (A. latifolia)	Golden Wattle
Ailanthus altissima	Tree of Heaven
Anthemis cotula	Mayweed
Aptenia cordifolia	Red Apple Iceplant
Arctotheca calendula	Cape Weed
Arundo donax	Giant Cane
Asparagas asparagoides	Bridal Creeper
Asparagus densiflorus & all varieties	Asparagus Fern
Asparagus setaceus	Fern Asparagus
Asphodelus fistulosa	Onionweed
Atriplex semibaccata	Australian Saltbush
Brassica nigra	Black Mustard
Brassica rapa	Field Mustard
Brassica tournefortii	Asian Mustard, Sahara Mustard

BOTANICAL NAME	COMMON NAME
Callistemon viminalis	Weeping Bottlebrush
Carpobrotus chilensis	Sea Fig, Highway Ice Plant
Carpobrotus edulis	Ice Plant
Centaurea solstitialis	Yellow Starthistle
Centranthus ruber	Red Valerian, Jupiter's Beard
Chrysanthemum coronarium	Garland or Crown Daisy
*Cirsium vulgare**	Wild Artichoke
Conium maculatum	Poison Hemlock
Cortaderia jubata & all varieties	Jubata Grass & all varieties
Cortaderia selloana & all varieties	Pampas Grass & all varieties
Cotoneaster lacteus	Cotoneaster
Cotoneaster pannosus	Silverleaf Cotoneaster
Crassula ovata (C. argentea)	Jade Plant
Cupaniopsis anacardioides	Carrot Wood
*Cynara cardunculus**	Artichoke Thistle
Cyperus involucratus (C. alternifolius)	African Umbrella Plant
Echium candicans (E. fastuosum)	Pride of Madeira

APPENDIX A
INVASIVE SPECIES

BOTANICAL NAME	COMMON NAME
Ehrharta longiflora	Long-flowered/Annual Veldt Grass
Eucalyptus camaldulensis (E. rostrata)	Red Gum, River Red Gum
Eucalyptus globulus	Eucalyptus Blue Gum
Ficus carica	Edible Fig
Foeniculum vulgare	Sweet Fennel, Wild Fennel
Fraxinus uhdei	Evergreen/Shamel/ Mexican/Tropical Ash
Gazania linearis (Gazania longiscapa)	Gazania, Gazania Daisy, Colorado Gold
Genista monspessulana	French Broom
Hedera canariensis	Algerian Ivy
Hedera helix	English Ivy
Hypericum canariense	Canary Island Hypericum
Hypericum perforatum	St. John's Wort
Ipomoea purpurea	Common Morning Glory
Iris pseudacorus	Yellow Iris

BOTANICAL NAME	COMMON NAME
Koelreuteria paniculata	Goldenrain Tree
*Lactuca serriola**	Prickly Lettuce
Lepidium latifolium	Perennial Pepperweed
Limonium perezii	Perez's Marsh-rosemary, Sea Lavender
Limonium ramosissimum	Algerian Sea Lavender
Limonium sinuatum	Wavy Leaf Sea Lavender, Statice
Lobularia maritima	Sweet Allyssum
Lonicera japonica & all varieties	Japanese Honeysuckle & all varieties
Lotus corniculatus	Birdfoot Trefoil
Ludwigia hexapetala (L. uruguayensis)	Uruguay Marsh-Purslane, Water Primrose
Lythrum salicaria	Purple Loosestrife
Malephora crocea	Red-flowered Ice Plant, Croceum Ice Plant
Melinus repens (Rhynchelytrum repens)	Natal Grass, Natal Ruby Grass, Red Top
Mentha pulegium	Pennyroyal

APPENDIX A
INVASIVE SPECIES

BOTANICAL NAME	COMMON NAME
Ehrharta calycina	Perennial Veldt Grass
Ehrharta erecta	Panic Veldt Grass
Mentha spicata	Spearmint
Mesembryanthemum crystallinum	Crystalline Ice Plant
Mesembryanthemum nodiflorum	Slender-leaved Ice Plant
Mirabilis jalapa (M. lindheimeri)	Four O-Clock, Marvel of Peru
Myoporum laetum	Ngaio Tree, Myoporum
Myriophyllum aquaticum	Parrotfeather
Myriophyllum spicatum	Eurasian Watermilfoil
Nassella tenuissima	Finestem Needlegrass, Mexican Feather Grass
Nerium oleanader	Oleander
Nicotiana glauca	Tree Tobacco
Oenothera speciosa	Mexican Evening Primose
Olea europaea (fruiting varieties)	Olive Tree

BOTANICAL NAME	COMMON NAME
Opuntia ficus-indica	Mission Prickly-Pear, Indian Fig, Tuna Cactus
Osteospermum fruticosum (Dimorphotheca fruticosa)	Trailing African Daisy, Freeway Daisy
Parkinsonia aculeata	Mexican Palo Verde, Jerusalem Thorn
Pennisetum villosum (Cenchrus villosus)	Feathertop Fountain Grass
Pennisetum ciliare (Cenchrus ciliare)	Buffelgrass
Pennisetum clandestinum (Cenchrus clandestinum)	Kikuyu Grass
Pennisetum setaceum (Cenchrus setaceum) & all varieties except 'Rubrum'/'Cupreum'	Fountain Grass
Phoenix canariensis	Canary Island Date Palm
Pittosporum undulatum	Victorian Box
Platanus x acerifolia	London Plane Tree
Prunus lyonii (Prunus ilicifolia ssp. lyonii*)*	Catalina Cherry
Retama monosperma (Genista monosperma)	Bridal Veil Broom
Ricinus communis	Castor Bean
Robinia pseudoacacia	Black Locust

APPENDIX A
INVASIVE SPECIES

BOTANICAL NAME	COMMON NAME
Salsola tragus	Russian Thistle
Schinus molle	California Pepper
Schinus terebinthifolius	Brazilian Pepper
Senna didymobotrya (Cassia didymobotrya)	Popcorn Senna, Popcorn Cassia, African Senna
Silybum marianum	Milk Thistle
Spartium junceum	Spanish Broom

BOTANICAL NAME	COMMON NAME
Tamarix species	Tamarisk
Tropaeolum majus	Garden Nasturtium
Ulmus parvifolia	Chinese Elm Tree
Vinca major	Periwinkle
Washington robusta	Mexican Fan Palm
Zantedeschia aethiopica (Calla aethiopica)	Calla-lily

The following references were used:

Los Angeles Regional Guide to Invasive Plants http://weedwatch.lasgrwc.org/Matrix_Master_20071022.pdf.

California Invasive Plant Council Inventory of California Invasive Plants http://www.cal-ipc.org/ip/inventory/index.php.

American Society of Landscape Architects, San Diego Chapter: Invasive Ornamental Plant Guide http://www.asla-sandiego.org/Download/PG_08_mod.pdf.

APPENDIX B
LOW WATER USE, IGNITION RESISTIVE PLANTS

Courtesy of Dixie Switzer

The intent of this list is to provide examples of plants that are less prone to ignite or spread flames to other vegetation during a fire and that can naturalize or survive without irrigation after growth has been established. This list indicates those plants that are considered native to California. It also excludes non-native invasive species that easily spread into natural, non-irrigated areas.

No plant is totally fire resistant. The plants listed have been chosen because they contain minimal amounts of flammable resins and have a low fuel volume. All plants on this list are considered to be drought-tolerant.

When first planting drought-tolerant plants, it is necessary to water deeply to encourage the plant roots to seek natural moisture in the soil. During this establishment period, many plants will require more water in summer than in winter but be careful not to overwater. Even in summer some natives will die if watered too much. Over a three year establishment period, these plants should be weaned off supplemental irrigation. Once established, these plants can grow and reproduce with only natural moisture such as rainfall. Occasional irrigation is necessary only in extreme drought conditions.

APPENDIX B
LOW WATER USE, IGNITION RESISTIVE PLANTS

LEGEND

* Native plant as identified in the Native Plant list published by the San Diego Chapter of the California Native Plant Society or the California Native Plant Link Exchange for San Diego County www.cnplx.info.

TYPE: A = Annual
C = Succulent
G = Groundcover
P = Perennial
S = Shrub
T = Tree

The following references were used to avoid any listing of invasive plants:

Los Angeles Regional Guide to Invasive Plants http://weedwatch.lasgrwc.org/Matrix_Master_20071022.pdf.

California Invasive Plant Council Inventory of California Invasive Plants http://www.cal-ipc.org/ip/inventory/index.php.

American Society of Landscape Architects, San Diego Chapter: Invasive Ornamental Plant Guide http://www.asla-sandiego.org/Download/PG_08_mod.pdf.

APPENDIX B
LOW WATER USE, IGNITION RESISTIVE PLANTS

Yarrow

California Buckeye

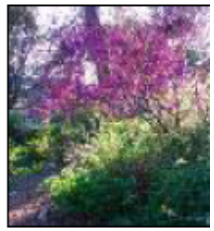
Desert Century

Shaw's Century

BOTANICAL NAME	COMMON NAME	TYPE
Achillea Tomentosa*	Wooly Yarrow	G
Aesculus californica*	California Buckeye	T/S
Agave		
americana	Century Plant	C
deserti*	Desert Century Plant	C
shawii*	Shaw's Century Plant	C
Aloe arborescens	Tree Aloe	C
Alyogyne huegelii	Blue Hibiscus	S
Antigonon leptopus*	San Miguel Coral Vine	V
Arbutus unedo	Strawberry Tree	T
Baccharis glutinosa*	Mule Fat	S
Brachychiton populneus	Bottle Tree	T
Caesalpinia gilliesii	Bird of Paradise Bush	S
Calliandra californica*	Baja Fairy Duster	S
Cassia artemisioides	Feathey Senna	S
Ceanothus spp.*	California Lilac	S/G
Ceratonia siliqua	Carob	T
Cercidium floridum	Blue Palo Verde	T
Cercis occidentalis*	Western Redbud	T/S

Mule Fat

California Mountain Lilac (Ceanothus)



Western Redbud

APPENDIX B
LOW WATER USE, IGNITION RESISTIVE PLANTS

Used with permission of www.lasplitas.com

Summer Holly

Used with permission of www.lasplitas.com

Coast Sunflower

Used with permission of www.lasplitas.com

Giant Coreopsis

BOTANICAL NAME	COMMON NAME	TYPE
Comarostaphylis diversifolia*	Summer Holly	S
Convolvulus cneorum	Bush Morning Glory	S
Coreopsis		
gigantea*	Giant Coreopsis	P
maritima*	Sea Dahlia	P
verticillata	Coreopsis	P
Dalea		
orcuttii	Orcutt's Delea	S
spinosa	Smoke Tree	S
Delosperma alba	White Trailing Ice Plant	G
Dudleya		
brittonii*	Britton's Chalk Dudleya	G
pulverulenta*	Chalk Dudleya	G
virens*	Island Live-Forever	G
Elaeagnus pungens	Silverberry	S
Encelia		
californica*	Coast Sunflower	P
farinosa*	White Brittlebush	P
Eriophyllum confertiflorum*	Golden Yarrow	S
Erythrina caffra	Kaffirboom Coral Tree	T

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Sea Dahlia

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Chalk Dudleya

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White Brittlebush

APPENDIX B
LOW WATER USE, IGNITION RESISTIVE PLANTS

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Golden Yarrow

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California Poppy

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Island Bush-Snapdragon

BOTANICAL NAME	COMMON NAME	TYPE
Eschscholzia californica*	California Poppy	G/A
Ferocactus viridescens*	Coast Barrel Cactus	C
Fouquieria splendens*	Ocotillo	C
Galvezia		
Juncea*	Baja Bush-Snapdragon	S
speciosa*	Island Bush-Snapdragon	S
Garrya flavescens*	Ashy Silktassel	S
Grevillea spp.	Grevillea	T/S/G
Helianthemum spp.*	Sunrose	G
Hesperaloe parviflora	Red Yucca	C
Heteromeles arbutifolia*	Toyon	S
Iva hayesiana*	Poverty Weed	P
Juglans		
californica*	California Walnut	T
hindsii	California Black Walnut	T
Keckiella cordifolia*	Heart-Leaved Penstemon	V
Kniphofia uvaria	Red-Hot Poker	P
Lampranthus aurantiacus	Ice Plant	G
Lantana spp.	Lantana	S/G

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Ashy Silktassel

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Sunrose

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Toyon

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Poverty Weed

APPENDIX B
LOW WATER USE, IGNITION RESISTIVE PLANTS

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California Walnut

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Heart-Leaved Penstemon

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Chaparral Honeysuckle

BOTANICAL NAME	COMMON NAME	TYPE
Lasthenia californica*	Common Goldfields	G
Laurus nobilis	Sweet Bay	T/S
Lavandula spp.	Lavender	P
Leucophyllum frutescens	Texas Ranger	S
Lonicera subspicata*	Chaparral Honeysuckle	V
Lotus scoparius*	Deerweed	S
Lupinus spp.	Lupine	G/A
Lyonothamnus floribundus spp.		
asplenifolius*	Fernleaf Catalina Ironwood	T
Malacothamnus fasciculatus*	Mesa Bushmallow	S
Nolina		
parryi*	Parry's Nolina	C
parryi spp. Wolfii*	Wolf's Bear Grass	C
Penstemon spp. (wild)*	Penstemon wild	P
Pittosporum phillyraeoides	Willow Pittosporum	T
Portulacaria afra	Elephant's Food	T/S
Prunus		
ilicifolia*	Hollyleaf Cherry	T/S
lyonii	Catalina Cherry	T/S

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Deerweed

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Fernleaf Catalina

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Mesa Bushmallow

APPENDIX B
LOW WATER USE, IGNITION RESISTIVE PLANTS

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Wild Penstemon

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Hollyleaf Cherry

Courtesy of Dixie Switzer

Coast Live Oak

BOTANICAL NAME	COMMON NAME	TYPE
Quercus		
agrifolia*	Coast Live Oak	T
dumosa*	Scrub Oak	S
engelmannii*	Engelmann Oak	T
suber	Cork Oak	T
Rhamnus californica*	Coffeeberry	S
Robinia Ambigua 'Purple Robe'	Purple Robe Locust	T
Romneya coulteri*	Matilija Poppy	S
Rosa		
californica*	California Wild Rose	S
minutifolia*	Baja California Wild Rose	S
Sambucus spp.	Elderberry	S
Santolina		
chamaecyparissus	Lavender Cotton	P
virens	Santolina	P
Sedum spp.	Stonecrops	C
Senecio cineraria	Dusty Miller	P
Sisyrinchium bellum*	Blue-Eyed Grass	P
Symphoricarpos mollis*	Creeping Snowberry	S

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Engelmann Oak

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Coffeeberry

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Matilija Poppy

APPENDIX B
LOW WATER USE, IGNITION RESISTIVE PLANTS

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California Wild

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Blue-Eyed Grass

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Creeping Snowberry

BOTANICAL NAME	COMMON NAME	TYPE
Tagetes lemmonii	Copper Canyon Daisy	P
Teucrium fruticans	Bush Germander	S
Ulmus pumila	Siberian Elm	T
Verbena lilacina*	Lilac Verbena	P
Viguiera laciniata*	San Diego Sunflower	G
Westringia fruticosa	Coast Rosemary	S
Yucca		
schidigera*	Mojave Yucca	C
whipplei*	Foothill Yucca	C
Zauschneria		
californica	California Fuschia	P
cana	Hoary California Fuschia	P
'Catalina'	Catalina Fuschia	P

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San Diego Sunflower

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Mojave Yucca

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Foothill Yucca

Please note: The above list is not intended as a comprehensive compilation of all plants that meets the criteria of lov water use, ignition resistive, and non-invasive. It only suggests some plants that meet the criteria.

APPENDIX C
UNDESIRABLE PLANTS

The following vegetation is more susceptible to burning due to rough or peeling bark, production of large amounts of litter, vegetation that contains oils, resin, wax or pitch, large amounts of dead material in the plant, or plantings with a high dead to live fuel ratio. To reduce the possibility of fire spreading to structures, these plants should be avoided within the first 50 feet adjacent to a structure.

- ⇒ Eucalyptus
- ⇒ Pines
- ⇒ Rosemary
- ⇒ Larger California sagebrush
- ⇒ Chamise
- ⇒ Tea trees
- ⇒ Pepper trees
- ⇒ Acacias
- ⇒ Junipers
- ⇒ Pampas grass
- ⇒ Palms

If the owner wishes to retain these plants, they must be adequately maintained (pruning, thinning, irrigation, litter removal and weeding) to reduce the potential for spreading a fire.

EXHIBIT D

BehavePlus 6.00 (Build 626 Beta 5)
Sanctuary
Head Fire
Wed, Feb 12, 2020 at 11:49:50

Input Worksheet

Inputs: SURFACE

Input Variables		Units	Input Value(s)
Fuel/Vegetation, Surface/Understory			
	Fuel Model		4,sh5,sh7
Fuel Moisture			
	1-h Fuel Moisture	%	3
	10-h Fuel Moisture	%	4
	100-h Fuel Moisture	%	5
	Live Herbaceous Fuel Moisture	%	30
	Live Woody Fuel Moisture	%	60
Weather			
	Midflame Wind Speed (upslope)	mi/h	11
Terrain			
	Slope Steepness	%	10
Notes			
	Due to the amount of dead in the chamise, I considered using FM4 but Shrub 5 (SH5) is probably the best fit.		
	Slope is essentially flat.		
	1-hour fuel moisture calculated from temp of 100°F and RH of 12% Sept 15, 1400 hours.		
	South west wind at 19 mph		

Run Option Notes

Maximum effective wind speed limit IS imposed [SURFACE].
Fire spread is in the HEADING direction only [SURFACE].
Wind is blowing upslope [SURFACE].
Wind and spread directions are degrees clockwise from upslope [SURFACE].
Direction of the wind vector is the direction the wind is pushing the fire [SURFACE].

Head Fire

Results

Fuel Model	Surface Fire Rate of Spread ch/h	Surface Flame Length ft
4	374.9	44.6
sh5	228	27.9
sh7	147.2	26.2