

FIRE PROTECTION PLAN
Canyon Ranch Tract 20402
City of Redlands
County of San Bernardino, California



4 October 2021 Second Iteration 28 April 2022

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Canyon Ranch TTM 20402

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FIRE PROTECTION PLAN

City of Redlands, California

1.0 GENERAL DESCRIPTION

TR20402 proposes the subdivide 21.6 acres into 27 single-family residential lots. The subdivision creates ten (5) lettered lots allocated for open space, water quality basin, and landscaping. It is vacant and heavily disturbed.

Figure 1 provides a conceptual design.

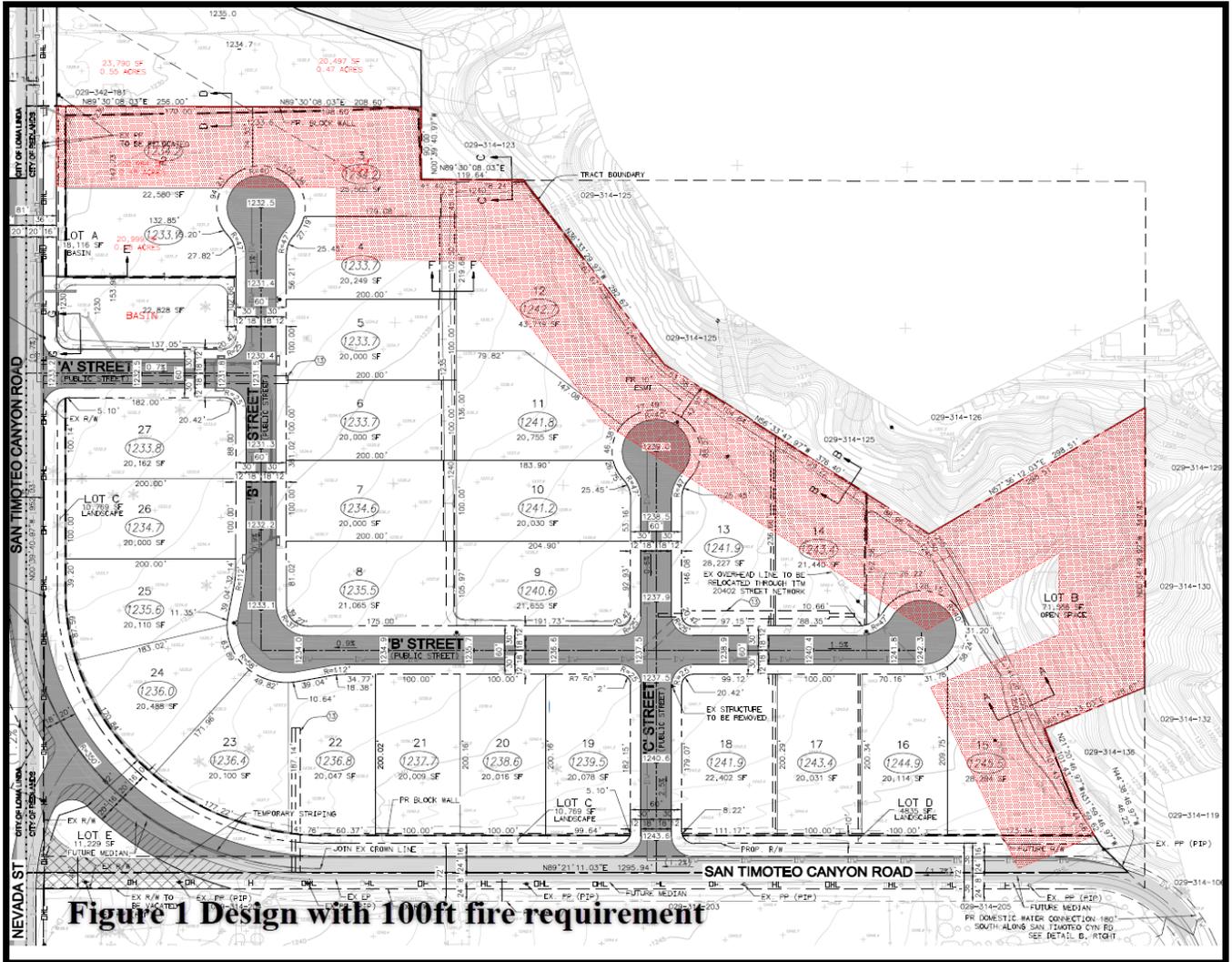


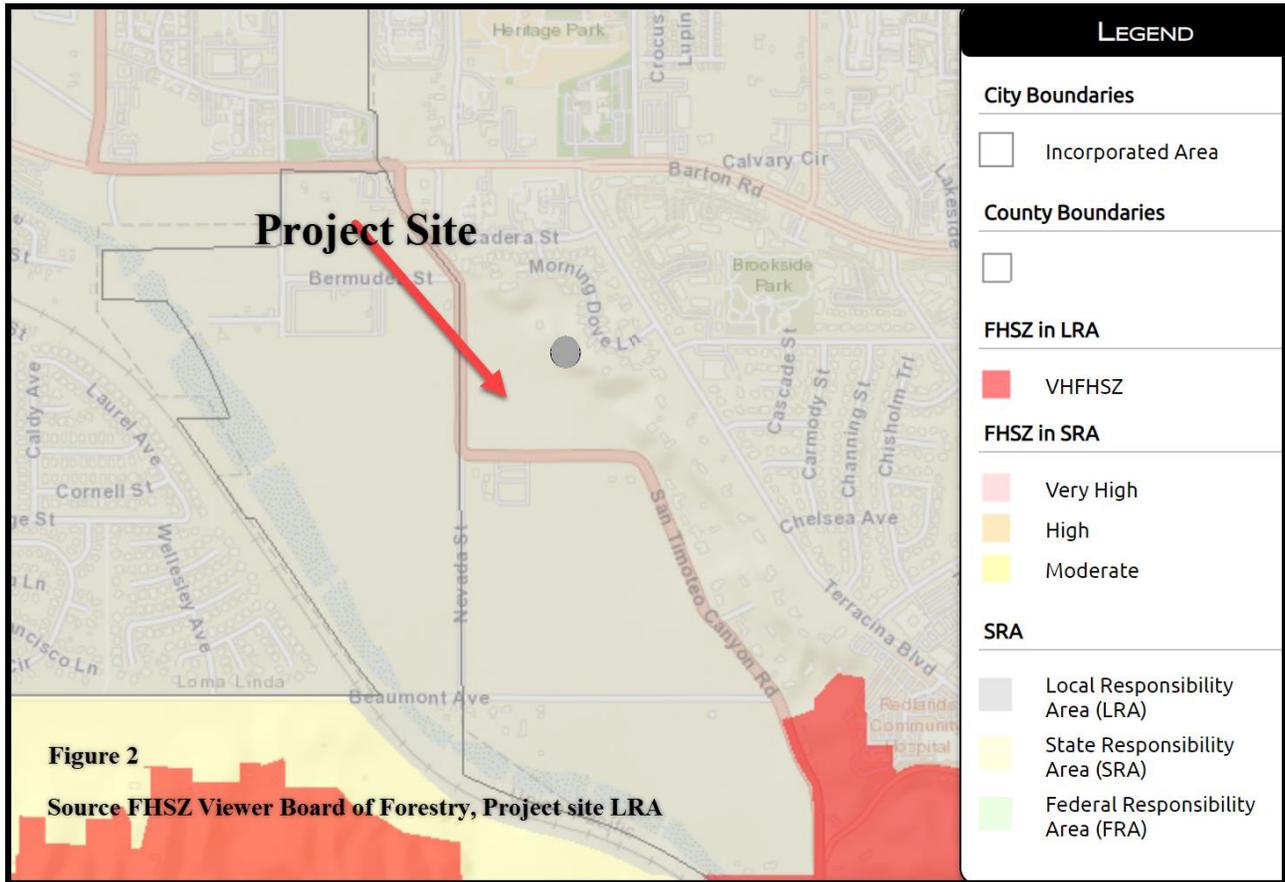
Figure 1 Design with 100ft fire requirement

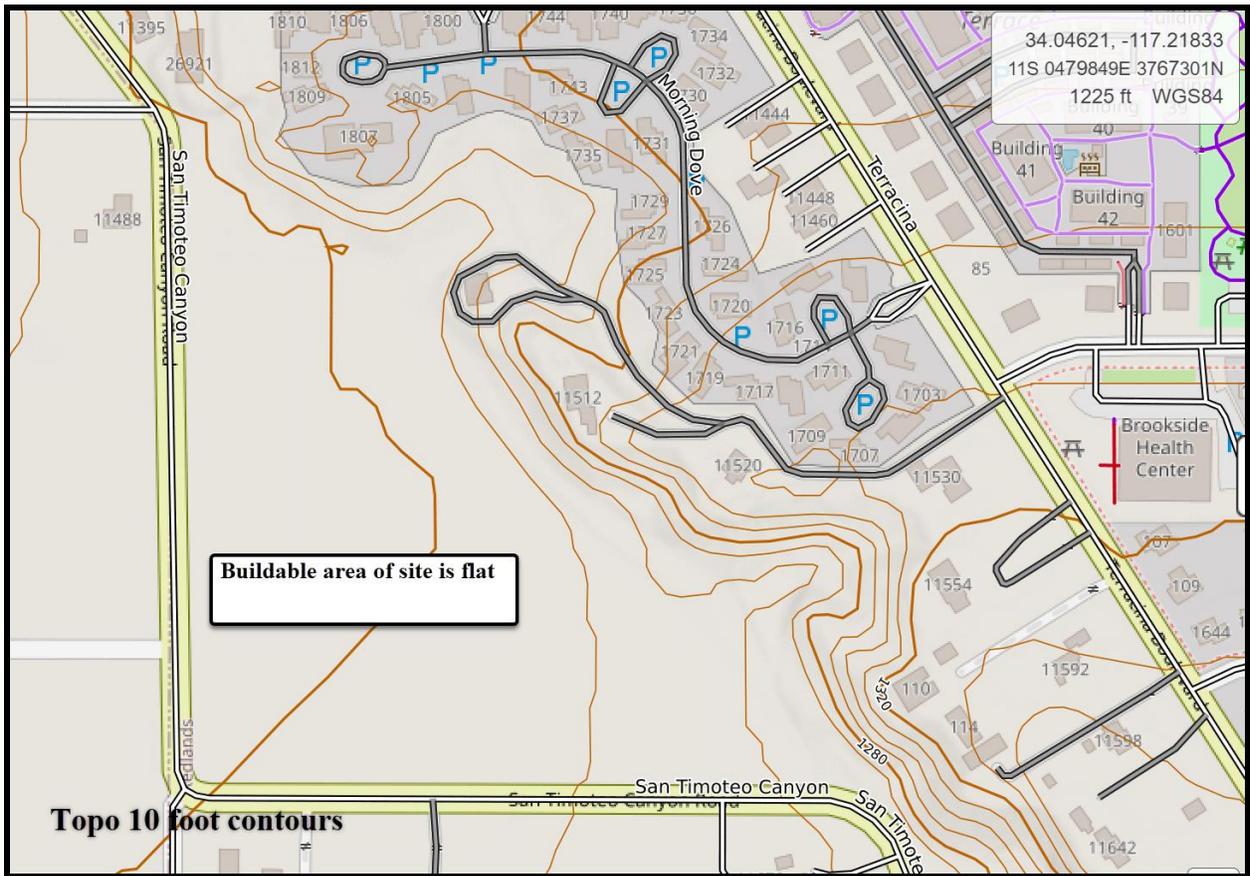
NUMBER OF LOTS	27
SITE ACREAGE:	21.6 ACRE
PROPOSED DENSITY:	2.2 DU/ACRE
RESIDENTIAL & STREET ACREAGE:	19.6 ACRE (90.7%)
DETENTION BASIN ACREAGE (LOT A):	0.4 ACRE (1.9%)
OPEN SPACE ACREAGE (LOT B):	1.6 ACRE (7.4%)
LOT SIZES:	20,000 MIN
LOT DIMENSIONS:	100 FT X 200 FT MIN
ZONING:	RA

Project Location:

The Project site is located north and east of San Timoteo Canyon Road in the City of Redlands, County of San Bernardino County within Assessor's Parcel Numbers (APNs) 029-313-201 and 029-314-137.

The proposed development is within LRA and is within a Very High Fire Severity Zone. Figure 2





Refer to Vegetation Management Exhibit for the illustration of property lines, structures and related Vegetation Management.

A Fire Protection Plan (FPP) must be submitted and accepted by the City of Redlands Fire Department (RFD). Approval process will be through the Planning Commission and City Council action. The approved FPP shall be recorded against all buildable lots. The FPP assesses the overall (on-site and off-site) wildland fire hazards and risks that may threaten life and property associated with the proposed Development. In addition, the FPP establishes both short-term and long-term vegetation management actions required to minimize any projected wildland fire hazards and assigns annual maintenance responsibilities for each of the required Vegetation Management actions.

1.1 General Information

Owner: Ross Yamaguchi
Highpointe Communities
Canyon Ranch Development LLC
530 Technology, Suite 100
Irvine, CA 92618
949-303-6510

Accepting Departments: Agency having Jurisdiction, City of Redlands

Fire Authority/Fire Construction Permits: City of Redlands
 Water Distribution System: City of Redlands Municipal Utilities

This FPP provides Vegetation Management Zone(s) treatment and construction feature direction for developers, architects, builders, and the individual lot owner. The document will be used in making the structures in the proposed project safe from future wildfires.

Appendices attached to this FPP provide additional information and shall be considered part of this FPP.

The purpose of this FPP is to provide Vegetation Management Zone treatment and construction feature direction for developers, architects, builders, the City of Redlands and the individual lot owner. The document will be used in making the structures in the proposed project safe from future wildfires.

Requirements for this FPP are based upon requirements listed in the 2019 California Fire Code, Chapter 49. Public Resources Code, Sections 4201 through 4204, and Government Code, Sections 51175 through 51189, or other areas designated by the enforcing agency to be at a significant risk from wildfires.

Chapter 7A-California Building Code; 2019 California Residential Code sections R337; National Fire Protection Association Standards (NFPA) 13-D, 2019 Edition. Local Amendments as required.

Hazardous vegetation and fuels around all applicable buildings and structures shall be maintained in accordance with the following laws and/or regulations:

Public Resources Code, Section 4291. California Code of Regulations, Title 14, Division 1.5, Chapter 7, Subchapter 3, Section 1299 (see guidance for implementation "General Guideline to Create Defensible Space"). California Government Code, Section 51182. California Code of Regulations, Title 19, Division 1, Chapter 7, Subchapter 1, Section 3.07.

2.0 WILDLAND FIRE HAZARD AND RISK ASSESSMENT

In assessing the wildland fire hazard, it is necessary to consider plant succession and the climax plant communities. The vegetation described below is the most likely climax plant community that will exist without human intervention and the one utilized for planning purposes.

2.1 On and Off-Site Fire Hazard and Risk Assessment

Habitat on site consists almost entirely of invasives and some grassland. It is dominated by Russian thistle (*Kali tragus*). It appears the property was once used for agriculture.

Native species observed on site include telegraph weed (*Heterotheca grandiflora*), California buckwheat (*Eriogonum fasciculatum*), bristlebush (*Encelia farinosa*), common phacelia (*Phacelia distans*), common sunflower (*Helianthus annuus*), and common fiddleneck (*Amsinckia intermedia*).

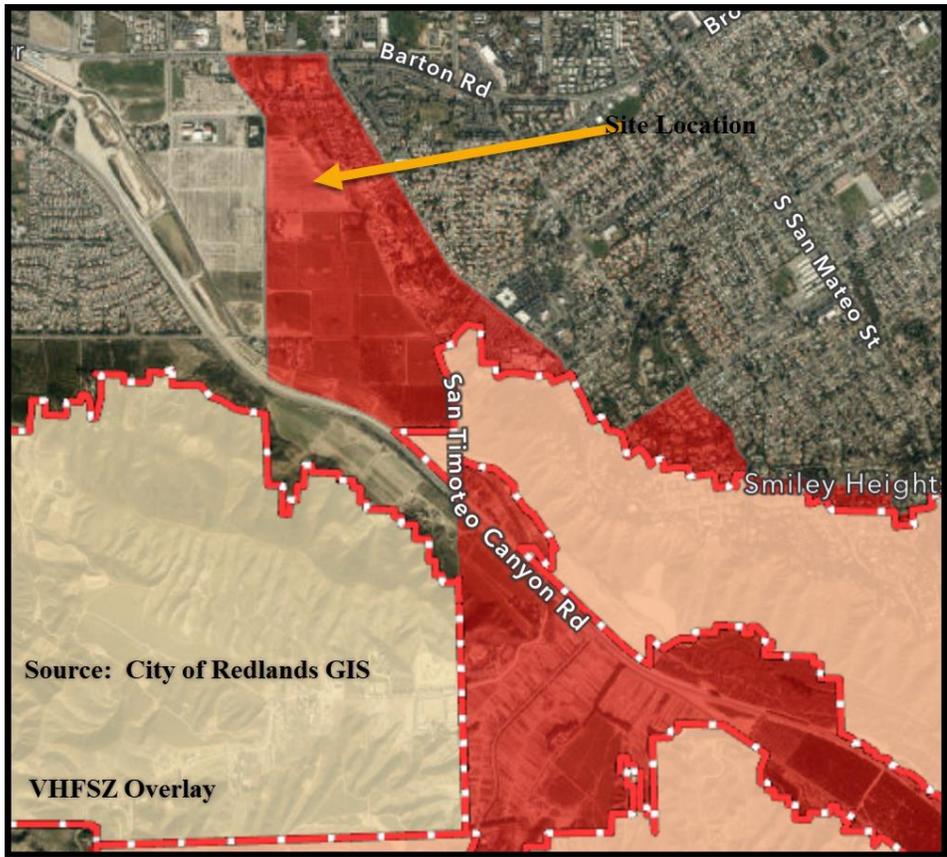
The non-native vegetation present within the project area consists of primarily of wild oat (*Avena fatua*) and tocalote (*Centaurea mellitensis*) with red brome (*Bromus rubens*), ripgut brome (*Bromus diandrus*), redstem filaree (*Erodium cicutarium*), and summer mustard (*Hirschfeldia incana*) also present. Trees on site are nonnative and species were limited to tree-of-heaven (*Ailanthus altissima*), Mexican fan palm (*Washingtonia robusta*), and red gum (*Eucalyptus camaldulensis*).

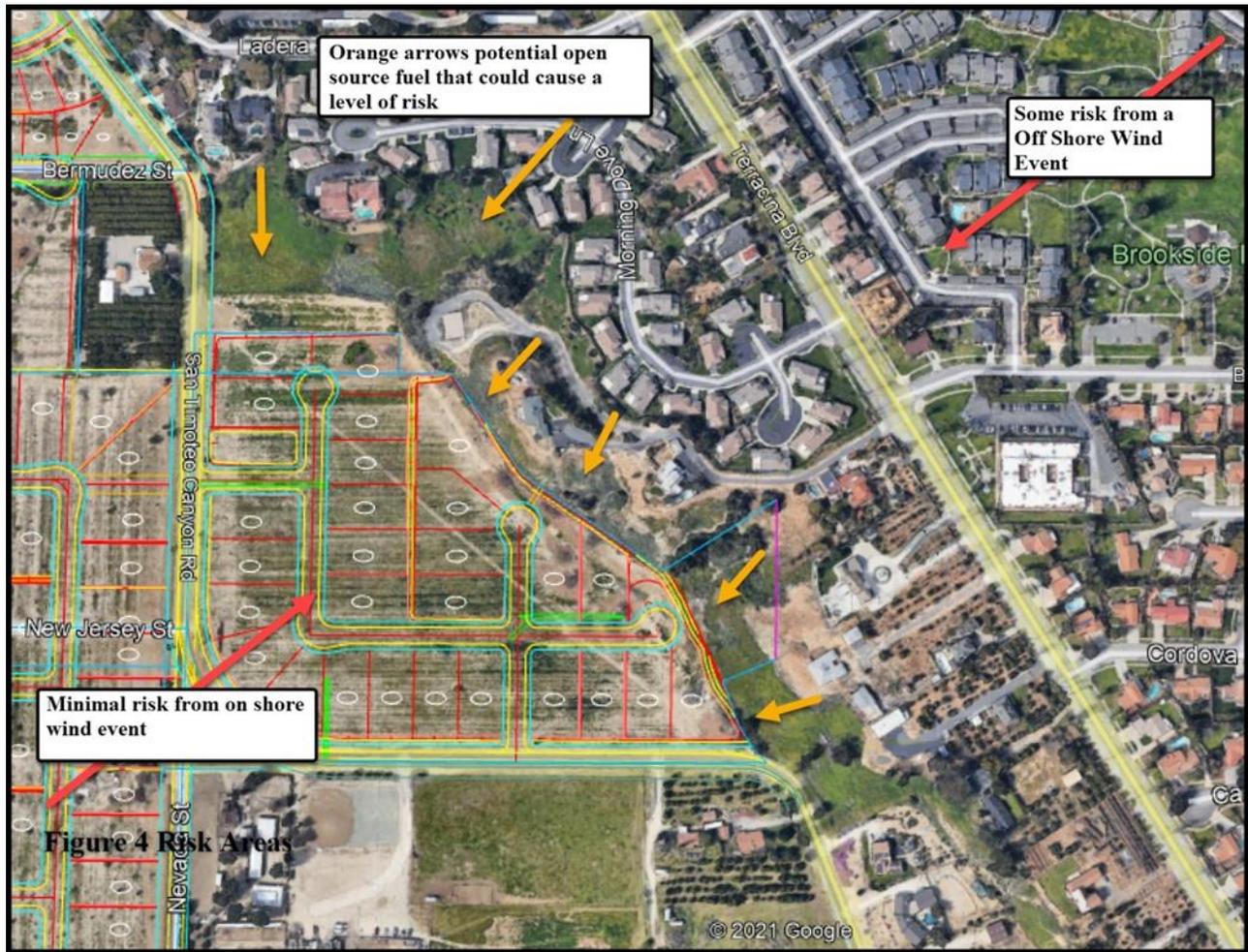
For Fire Behavior planning purposes, a combined Fuel Model SH2 at 40% and GS2 at 60% was used to best evaluate the flame lengths this works well with tumble weed and lighter fuels.

All these plants are adapted to intense wildfires, needed for species regeneration and survival.

Various slope areas have been affected by years of drought and mixed use with areas of increased dead fuel loading. Also effecting fuel loading is the effects of the local Mediterranean climate where warm wet winters promote abundant new growth, and long, hot and very dry summer seasons frequently occur. Occasionally, multi-year droughts cause significant parts of these plants to die back.

Figure 3 provides the Fire History surrounding the Site. There is no indication that it has burned recently, smaller fires may not have been captured to be represented. Figure 4 is the VHFSZ overlay. Figure 5 details those lots at greatest risk.

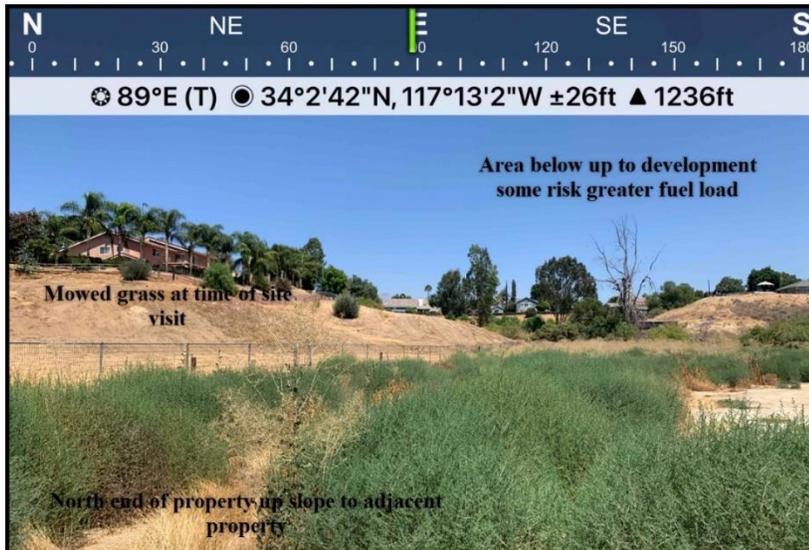




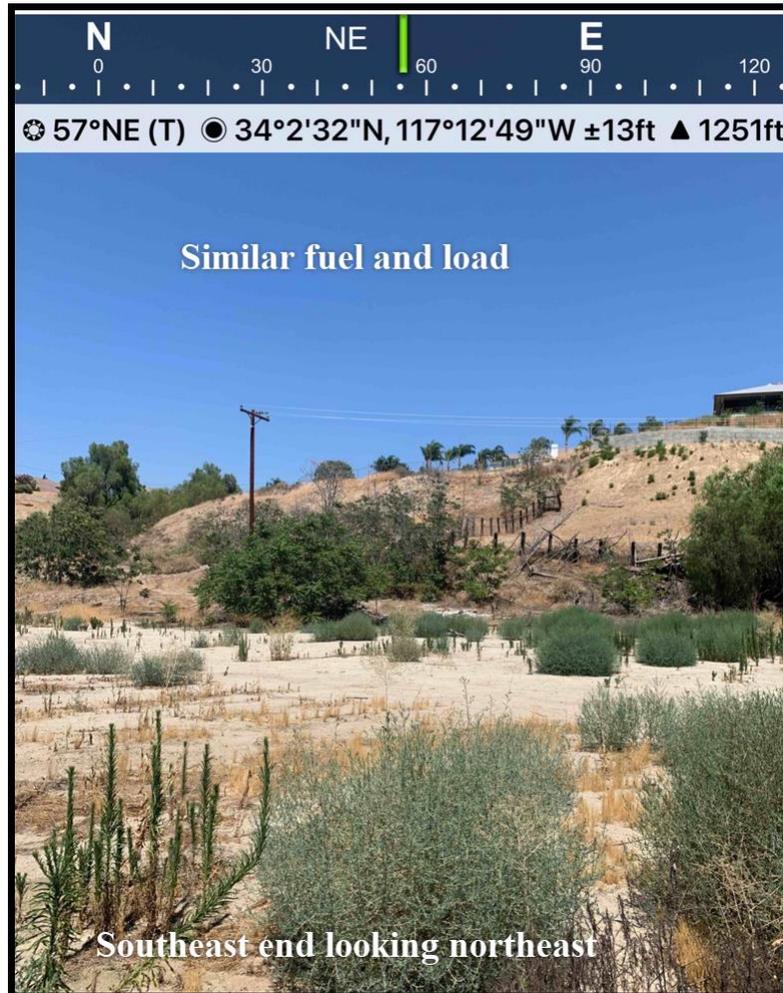
Site Photos

The major wildland fire threat is from the east, moving through the adjacent open fuels could cause an ember attack risk to the development.

Fuels are consistent with model, expect very fast rates of spread.







Any wildfire burning in the undeveloped easterly open space areas, adjacent to the proposed project boundary, would create a high wildland fire hazard, putting developed properties at risk.

The proposed fuel modification, Zones 1 dimensions vary from a minimum of 21 feet to 29 feet up to the PL and CMU barrier. Common areas will be maintained by an HOA.

2.2 Climate

The climate within the project area would be characterized as Mediterranean. It has generally mild and wet (14 to 16 inches per year) winters, the bulk of the annual precipitation falling between January and March. Long, hot and very dry summer seasons frequently occur with occasional multi-year droughts.

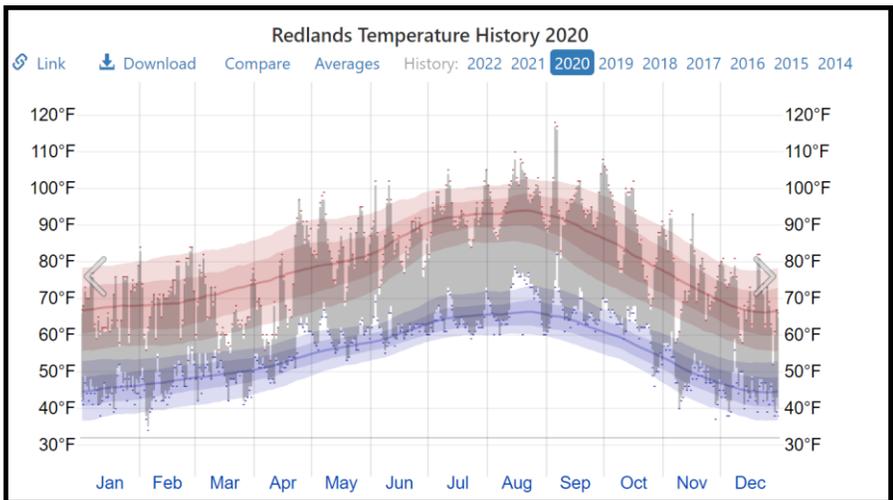
The most critical weather pattern is a hot, dry offshore wind, typically called a Santa Ana. Such wind conditions are usually associated with strong (>70 MPH), hot, dry winds with very low (<15%) relative humidity. Santa Ana winds originate over the dry desert land and can occur anytime of the year; however, they generally occur in the late fall (September through November). This is also when non-irrigated vegetation is at its lowest moisture content.

The undeveloped land in proximity can contribute to a damaging wildland fire event. Any wind or topography driven wildfire burning under a northeastern (*Santa Ana*) wind pattern through areas to the north northeast would create a wildland fire hazard to the proposed project.

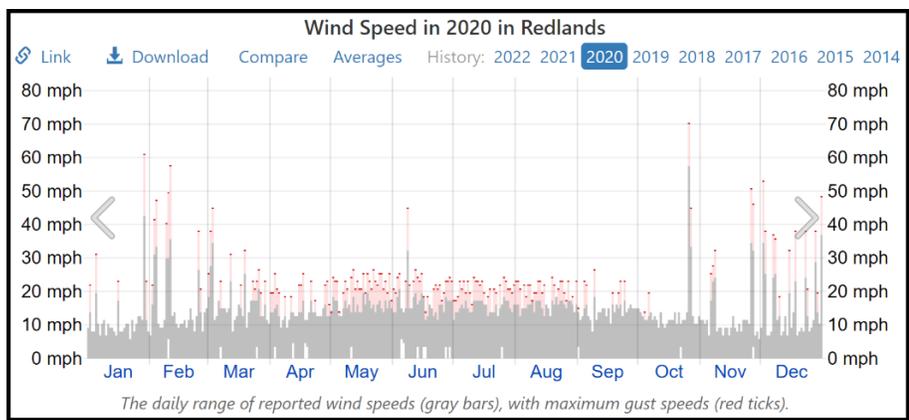
The typical prevailing summertime wind pattern is out of the south or southwest and normally is of a much lower velocity (5-19 MPH) with occasional gusts to 30-MPH) and is associated with higher relative humidity readings.

All other (west around to north) wind directions may be occasionally strong and gusty. However, they are generally associated with cooler moist air and often have higher relative humidity (> 40%). They are considered a serious wildland fire weather condition when wind speeds reach > 20-MPH.

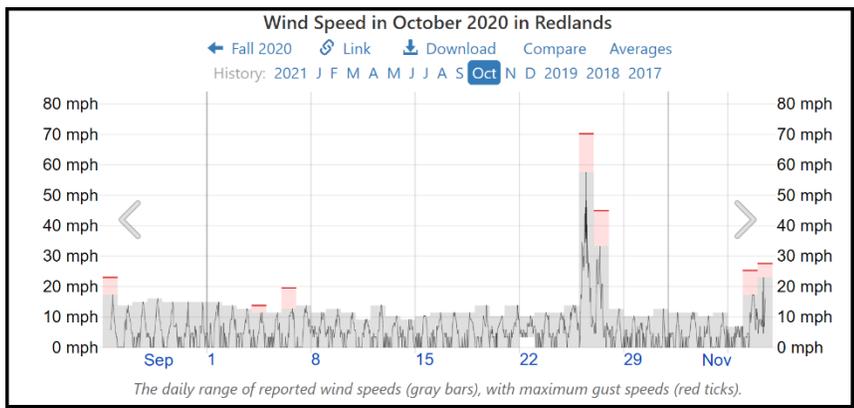
- The following illustrations provide snapshot wind and temperatures for September 2020 during the time of the El Darado Fire, the most recent nearby catastrophic event.



Source: Weatherspark.com1965/2020/Historical-Weather



Source: Weatherspark.com1965/2020/Historical-Weather



Source: Weatherspark.com1965/2020/Historical-Weather

- All residential structures in the area are threatened through wind-blown embers. The use of ‘ignition resistant construction’ will generally mitigate against a windblown ember threat (see Section 5.5 for

a discussion of these features). The goal of this FPP is to prevent the loss of lives, buildings and personal property when wildfires occur. The challenge is using a ‘best practices’ approach to construction and vegetation management, within a fully functioning mixed chaparral habitat. This goal is accomplished by requiring the home to be built with ignition resistant materials and properly designed and maintained vegetation management treatments that safely mitigate the fire fuel hazard to insignificant levels.

2.3 Predicting Wildland Fire Behavior

The BEHAVE 5.0.5 Fire Behavior Prediction and Fuel Modeling System developed by USDA–Forest Service research scientists Patricia L. Andrews and Collin D. Bevins at the Intermountain Forest Fire Laboratory, Missoula, Montana, is one of the best systematic methods for predicting wildland fire behavior. The BEHAVE fire behavior computer modeling system is utilized by wildland fire experts and managers nationwide. The program projects the expected spotting distance, rate-of-spread and flame lengths with a reasonable degree of certainty for use in Fire Protection Planning purposes. **FIREWISE 2000, Inc.** used the BEHAVE 5.0.5 Fire Behavior Prediction Model to make the fire behavior assessments discussed below.

2.4 Wildland Fire Behavior Calculations for the Off-Site Hazardous Vegetative Fuels

Wildland fire behavior calculations have been projected for the hazardous vegetative fuels on the undeveloped areas in proximity to the proposed residence. These projections are based on scenarios that are ‘worst case’ San Bernadino County fire weather assumptions in the vicinity of the project area. Historical weather data was obtained from **Weatherspark.com 1965/2020/ Historical-Weather**.

The worst-case scenario is depicted below in Tables 2.2.1 and 2.2.2. All table display the expected Rate of Fire Spread (expressed in ft/min), and Flame Length (expressed in feet) include the calculation inputs used in the BEHAVE program which were obtained from project site observations and fuel moisture levels typically observed during the local fire season. Modeled with critical fuel moisture values.

Fuel Models used: SH2 40% to cover
Moderate load, dry climate shrub (S)
1-h Fuel Load 1.4 tons/ac
10-h Fuel Load 2.4 tons/ac
100-h Fuel Load 0.75 tons/ac

GS2 Moderate load, dry climate grass-shrub (D) 60% to cover
1-h Fuel Load 0.5 tons/ac
10-h Fuel Load 0.5 tons/ac
100-h Fuel Load 0 tons/ac

The following Behave results depicts a fire burning with no-wind within the surrounding topographic area. Base line results. (NON-TREATED)

No Wind pushing down to slope boundary	
Surface Rate of Spread (maximum)	8.0 ft/min
Fireline Intensity	98 Btu/ft/s
Flame Length	3.7 ft
Direction of Maximum Spread (from north)	90 deg

Depiction of slope analysis for Behave Inputs

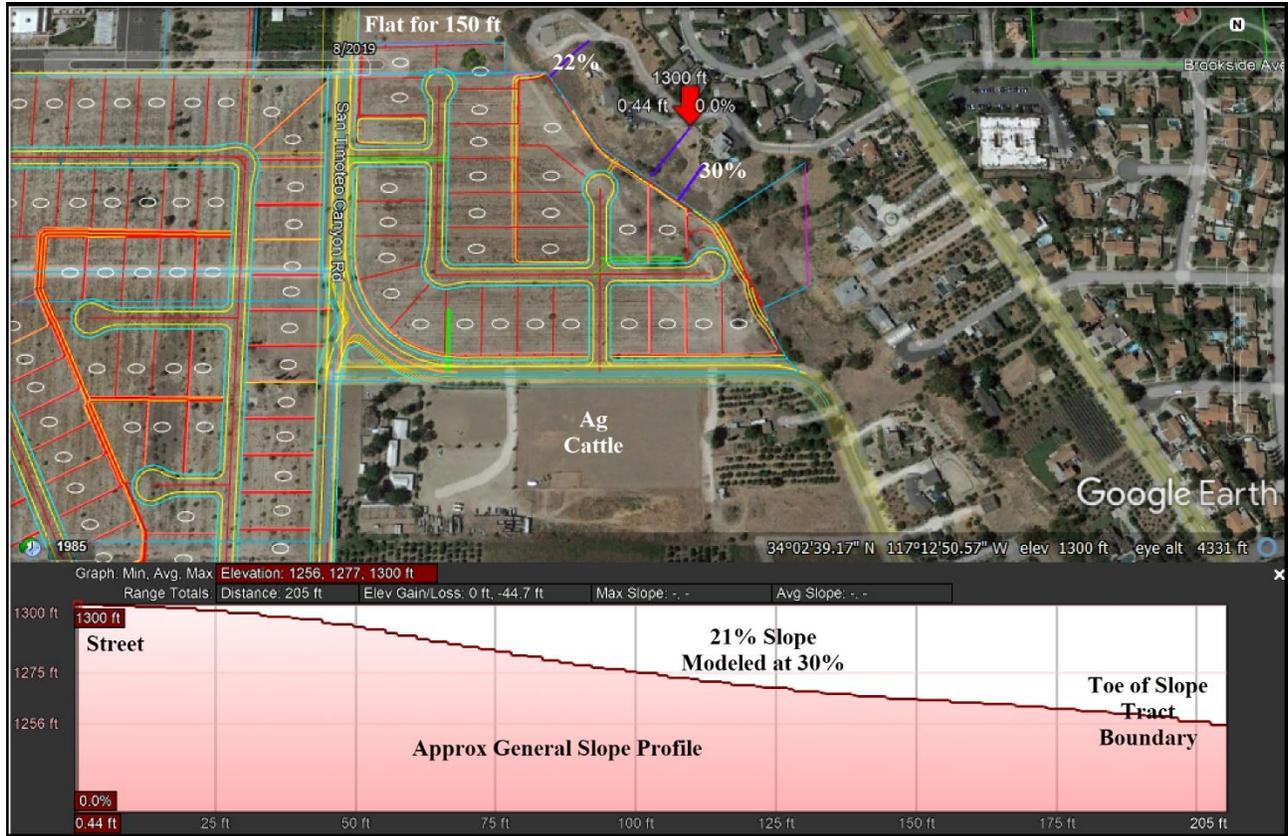


Table 2.2.1	
<i>Fire Scenario #1 - Fire Approaching from the North</i>	
<i>(Late Fire Season With 70 MPH North, Northeast Wind Conditions)</i>	
Eastern Boundary Slope Fuels	
Fire Behavior Calculation Input Data	Anticipated Fuel Moistures
<ul style="list-style-type: none"> • 30 percent slope • 70 mph 20-foot wind speed • 270° aspect from north • 45° wind direction 	<ul style="list-style-type: none"> * 1-Hour Fine Fuel Moisture of.....2% * 10-Hour Fuel Moisture of.....3% * 100-Hour Fuel Moisture of.....5% * Live Herbaceous Fuel Moisture of.....30% * Live Woody Fuel Moisture of.....50%
Expected Fire Behavior – Combined Fuel Model	
SH2 – Moderate Load, Dry Climate Shrub (40%) GS-2 Moderate load, dry climate grass-shrub (60%)	
Rate of Spread	- 523.2 ft/min
Fireline Intensity	- 6924 btu/ft/s
Flame Length	- 26.3 feet

Table 2.2.2
Fire Scenario #1 - Fire Approaching from the North
(Late Fire Season With 70 MPH North, Wind Conditions)
Northerly Grassland Fuels at Boundary

Fire Behavior Calculation Input Data

- 0 percent slope
- 70 mph 20-foot wind speed
- 0 aspect from north
- 45° wind direction

Anticipated Fuel Moistures

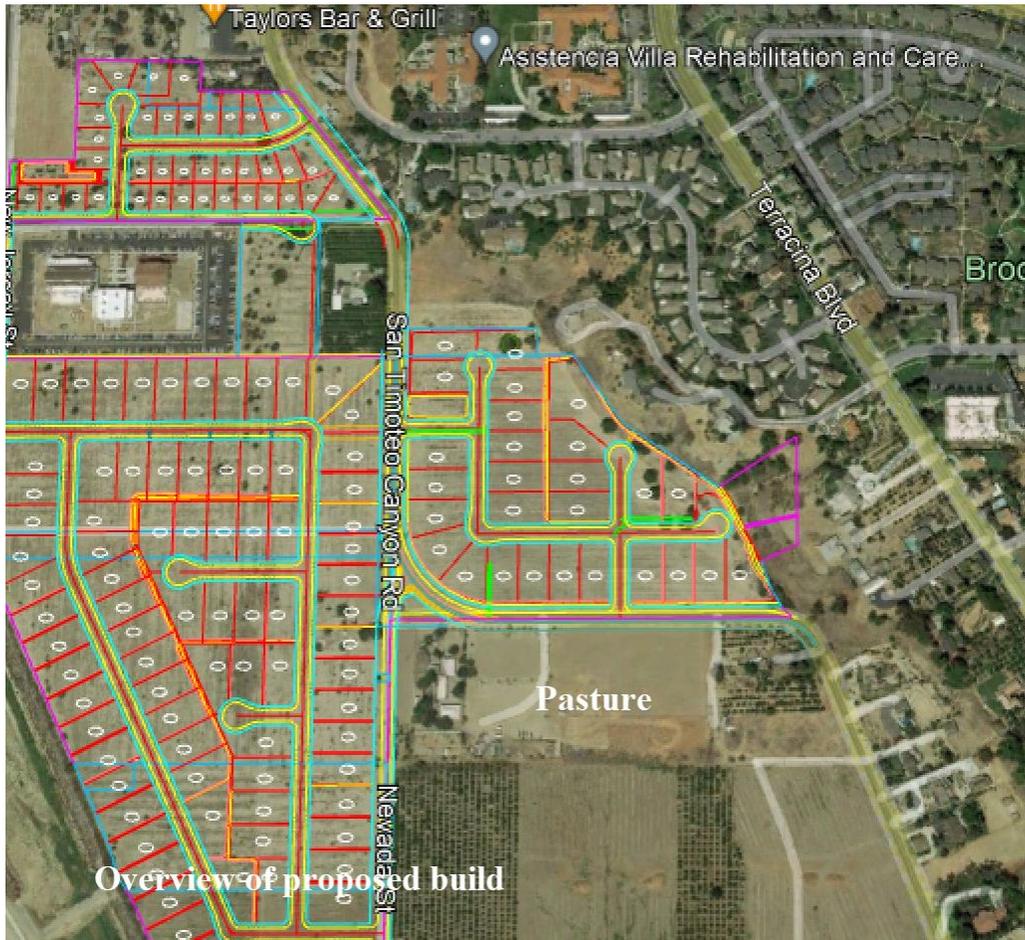
- * 1-Hour Fine Fuel Moisture of.....2%
- * 10-Hour Fuel Moisture of.....3%
- * 100-Hour Fuel Moisture of.....5%
- * Live Herbaceous Fuel Moisture of.....30%
- * Live Woody Fuel Moisture of.....50%

Expected Fire Behavior –Fuel Model
GR2 Low load, dry climate grass (D) Mowed Grassland

Rate of Spread - 368.8 ft/min
Fireline Intensity - 1791 btu/ft/s
Flame Length - 14.1 feet



There is no fire behaviour prepared for a southwest wind event, the area will be built eliminating existing surface fuels, additionally the area south of the project is Ag grazing land and development.



3.0 ASSESSING STRUCTURE IGNITIONS IN THE WILDLAND/URBAN INTERFACE

Structure ignitions from wildland wildfires basically come from three sources of heat: convective firebrands (flying embers), direct flame impingement, and radiant heat. The Behave Plus Fire Behavior Computer Modeling Program does not address windblown embers or firebrands. Chapter 7a of the California Building Code and CRC 337 provides detailed requirements providing ignition resistant exterior building materials that will be used in the construction of Tract 20402, APPENDIX 'E' provides a description of 'ignition resistive construction features.

3.1 Firebrands

Firebrands are pieces of burning materials that detach from a burning fuel due to the strong convection drafts in the flaming zone. Firebrands may also be referred to as embers. Firebrands can be carried a long distance (one mile or more) by fire drafts and strong winds. Severe wildland/urban interface fires can produce heavy showers of firebrands. The chance of these firebrands igniting a structure will depend on the size and number of the firebrands, how long each ember burns after contact, and the type of building materials, building design, and construction features of the structure. Firebrands landing on combustible roofing and decks are common sources for structure ignition. They can also enter a structure through unscreened vents, decks and chimneys, unprotected skylights, and overhangs.

Even with non-combustible roofing, firebrands landing on leaves, needles, and other combustibles located on a roof (due to lack of maintenance) can cause structure ignition. Any open windows, doors or other types of unscreened openings are sources for embers to enter a structure during a wildland fire. If these maintenance issues are addressed on a regular basis, firebrands should not be a concern.

3.2 Radiant Heat/Direct Flame Impingement

Radiation and convection involve the transfer of heat directly from the flame. Unlike radiation heat transfer, convection requires that the flames or heat column contact the structure. An ignition from radiation (given an exposed flammable surface) heat transfer depends on two aspects of the flame: 1) the radiant heat flux to a combustible surface and, 2) the duration (length of time) of the radiant flux. The radiant heat flux depends on the flame zone size, flame-structure distance, and how much the combustible material of the structure is exposed to the flame. While the flame from a wildfire may approach 1,800 degrees Fahrenheit, it is the duration of heat that is more critical. For an example, a blow torch flame typically approaches 2,100 degrees Fahrenheit yet a person can easily pass his/her hand through the flame. Heat duration only becomes critical to a home with a wood exterior surface if the heat is allowed to remain for 30-90 seconds.

Research scientist Jack Cohen of the USDA Forest Service has found that a home's characteristics--its exterior materials and design in relation to the immediate area around a home within 100 feet--principally determine the home ignition potential. He calls the home and its immediate surroundings the home ignition zone. In a study of ignition of wood wallboard, tests by a USDA Forest Service research team described in the Proceedings, 1st International Fire and Materials Conference showed that flame impingement for sufficient length of time (approximately 1 min.) ignites a typical hardboard siding material. Since the requirement in this FPP is for a non-combustible wall or 1-hour fire resistive construction for the exterior portion of a structure, the home's exterior reaching ignition temperature is very unlikely due to either radiant or convective heat.

Fire agencies consider vegetation management as a principal approach to wildland fire hazard reduction. Whenever the flame lengths are within close proximity to the structure envelope and 1-2 minutes in duration or more, and if the setback and modified fuel is equal to or less than the separation of combustible vegetation from a combustible structure, there is a high probability of structure ignition. This is not necessarily from the radiant heat, but from a greater chance of ember intrusion into the structure.

Contact with a fire's convection heat column also may cause ignition but the temperature of the column's gases is generally not hot enough or long enough in duration to sustain the ignition of the structure.

Comparing the expected wildland fire behavior projections in each of the scenarios in Section 2.4 against the required fuel modification zones outlined in Section 5.0 demonstrates substantial reductions in the expected flame length and fireline intensity.

By requiring the structures exposed to the threat of wildfire to incorporate the following guidelines, those structures will be provided with the most effective treatment for minimizing losses from flame impingement and associated radiant heat intensities.

- Each structure is constructed of ignition resistant building materials.
- The area surrounding each structure contains an irrigated zone (defensible space) and a thinning zone (low fuel volume buffer strip) between the irrigated zone and the untreated fuels.

The eventual homeowners shall be required to maintain their properties to Zone 1 Vegetation Management standards and shall keep the roofs and rain gutters free of leaves, needles and other combustible debris. All firewood and other combustible materials must be properly stored away from the structures (minimum 30 ft.) so that embers falling on or near the structures have no suitable host.

3.3 Fire Resistant Plant Palette

Wildland fire research has shown that some types of plants, including many natives, are more fire resistant than others. These low fuel volume, non-oily, non-resinous plants are commonly referred to as 'fire resistant'.

This term comes with the proviso that each year these plants are pruned, all dead wood is removed and all grasses or other plant material are removed from beneath the circumference of their canopies. Some native species are not considered ‘undesirable’ from a wildfire risk management perspective provided they are properly maintained year round (refer to APPENDIX ‘B’ for a list of prohibited plant species).

- **Should any plant inadvertently appear on both the Recommended and Prohibited Lists, the listing on the Prohibited List shall prevail and it shall be prohibited.**

4.0 FIRE DEPARTMENT RESPONSE

The City of Redlands with auto or mutual aid from the County of San Bernadino have adequate emergency response equipment to protect Canyon Ranch TTM 20402.

There is no assurance that the fire stations, Redlands Fire Station 261 and 264 which have nearly the same response time 4.4 miles and 4.6 miles respectively, will be in their station when a wildfire threatens TR20402 from an ignition in the adjacent wildland area.

Engines may respond from other stations located further away or from other incidents.

On high/extreme fire danger days there often may be multiple fire starts and engine companies may be already deployed on other incidents.

Therefore **FIREWISE 2000, Inc.** planned projects use ‘*defensible space*’, ignition resistant building features, and key vegetation management strategies that enable residents to substantially increase their ability to survive a wildfire on their own and without the loss of their structure. The goal of this FPP therefore is to make the development and its eventual homeowners as safe as possible and able to survive on their own until such time as firefighting equipment arrives and/or residents can be safely evacuated.

5.0 VEGETATION MANAGEMENT ZONE DESCRIPTIONS & REQUIRED TREATMENTS

Below are the descriptions and required treatments for the Vegetation Management Zones. All distances in this report are measured horizontally. These distances are depicted on the attached Fire Protection Plan Exhibit.

Zones 1 dimensions vary from a minimum of 21ft to 29feet. Development to the east and north will tie into proposed Zones and protect the development from extensive open fuel beds. On-Shore winds will have little impact once the westerly tract in Loma Linda is completed.

The dimensions will cause these homes to have mitigation measures to be equivalent to 100 feet.

5.1 Vegetation Management Zone 0/1 Irrigated - HOMEOWNER MAINTAINED Light Green on Exhibit

Zone 0 Homeowner maintained Irrigated - An area starting at the structure envelope extending 5 feet outward. This zone includes the area under and around all attached decks, and requires the most stringent wildfire fuel reduction. This area shall be kept clear of combustibles, landscaping mulch, and any large shrubs and trees. It may have limited plants that are low growing, nonwoody, properly watered and maintained. Combustible fencing material shall not be attached to the structure.

Zone 1 Homeowner maintained is commonly called the defensible space zone and shall be free of all combustible construction and materials. It is an irrigated zone surrounding the structure. It is measured from the exterior walls of the structure or from the most distal point of a combustible projection. It provides the best protection against the high radiant heat produced by a wildfire. It also provides a generally open area in which fire suppression forces can operate during wildfire events. This zone includes a level or level-graded area around the structure.

Required Landscaping

- Plants in this zone shall be fire resistant/draught tolerant and shall not include any pyrophytes that are high in oils and resins such as pines, eucalyptus, cedar, cypress or juniper species. Thick or leathery leaf species with high moisture content are the most ‘fire resistant’. For proper plant selection refer

to APPENDIX 'A' for a list of acceptable or desirable plants and APPENDIX 'B' for the Prohibited Plant list.

- Zone 1 will be cleared of all fire prone and undesirable plant species (see APPENDIX 'B').
- Xeriscape™ designs, where compatible and hardscape such as concrete, rock, pavers, and similar non-combustible features are encouraged to break up fuel continuity within Zone 1.
- Focus should be on approved ground covers and lawns that shall be maintained at a height that does not exceed 4 inches.
- Shrubs should be low-growing and well-irrigated and should be selected from the plant list in APPENDIX 'A' or plants approved by RFD. Shrubs shall be single specimens or a grouping not exceeding three plants. Mature height of plants shall not exceed 48 inches. At mature growth, single plants or groupings of plants shall be separated from each other by at least 5 feet. Single specimens of plants or a grouping not exceeding three plants are allowed under mature trees.
- Trees shall be single specimens or groupings of not more than three trees selected from the approved plant list. Trees are to be planted such that the mature canopies will be at least 10 feet from the exterior walls of the structure or from the most distal point of a combustible projection, an attached accessory structure, or an accessory structure within 10 feet of a habitable building.
- An automatic irrigation system is required. Areas inside the drip line of native oak trees shall not be irrigated.

Required Maintenance

- The lot shall be maintained year round by the individual property owner within their property boundary (lot lines) as required by this FPP or Fire Prevention City of Redlands.
- Sprinkler systems shall be checked weekly to insure proper working order.
- Any dead or dying plant material shall be remove and replaced. Shrubs and trees are to be bi-annually maintained free of dead material.
- Trees shall be maintained such that the branches and limbs closest to the ground are pruned to a height from the ground that is equal to 1/3 the overall height of the tree or six feet from the ground, whichever is higher.
- All trees must be maintained to the current ANSI A300 standards [*Tree, Shrub, and Other Woody Plant Maintenance —Standard Practices (Pruning)*] (see www.treecareindustry.org/public/gov_standards_a300.htm).
- All trees must be maintained to the current ANSI Z133.1, Tree care operations standards.
- **All plantings shall be installed with at maturity growth in mind.**

5.2 Vegetation Management Zone 2 Irrigated HOA MAINTAINED Dark Green on Exhibit.

1. Park site near Lot 14

Required Landscaping

- Plants in this zone shall be fire resistant/draught tolerant and shall not include any pyrophytes that are high in oils and resins such as pines, eucalyptus, cedar, cypress or juniper species. Thick or leathery leaf species with high moisture content are the most 'fire resistant'. For proper plant selection refer to APPENDIX 'A' for a list of acceptable or desirable plants and APPENDIX 'B' for the Prohibited Plant list.
- Zone 1 will be cleared of all fire prone and undesirable plant species (see APPENDIX 'B').
- Xeriscape™ designs, where compatible and hardscape such as concrete, rock, pavers, and similar non-combustible features are encouraged to break up fuel continuity within Zone 1.
- Focus should be on approved ground covers and lawns that shall be maintained at a height that does not exceed 4 inches.
- Shrubs should be low-growing and well-irrigated and should be selected from the plant list in APPENDIX 'A' or plants approved by RFD. Shrubs shall be single specimens or a grouping not exceeding three plants. Mature height of plants shall not exceed 48 inches. At mature growth, single plants or groupings of plants shall be separated from each other by at least 5 feet. Single specimens of plants or a grouping not exceeding three plants are allowed under mature trees.

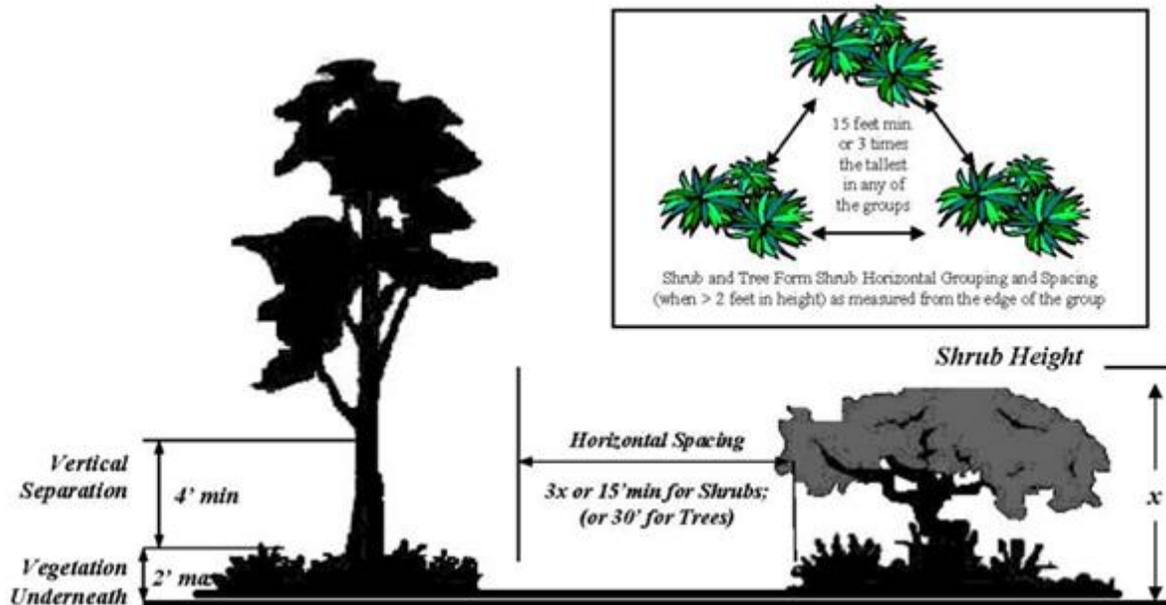
- Trees shall be single specimens or groupings of not more than three trees selected from the approved plant list. Trees are to be planted such that the mature canopies will be at least 10 feet from the exterior walls of the structure or from the most distal point of a combustible projection, an attached accessory structure, or an accessory structure within 10 feet of a habitable building.
- An automatic irrigation system is required. Areas inside the drip line of native oak trees shall not be irrigated.

Required Maintenance

- The lot shall be maintained year round by the HOA as required by this FPP or Fire Prevention City of Redlands.
- Sprinkler systems shall be checked weekly to insure proper working order.
- Any dead or dying plant material shall be remove and replaced. Shrubs and trees are to be bi-annually maintained free of dead material.
- Trees shall be maintained such that the branches and limbs closest to the ground are pruned to a height from the ground that is equal to 1/3 the overall height of the tree or six feet from the ground, whichever is higher.
- All trees/shrubs must be maintained to the current ANSI Z133.1, Tree care operations standards.
- **All plantings shall be installed with at maturity growth in mind.**

Requirements for Planting Installation in Fuel Modification Zones

Spacing and Separation



Horizontal Spacing

Vegetation Less than 2 Feet in Height:

- No horizontal spacing or vertical separation is required. Ground cover shall not exceed 2 feet in height. In Zone B, ground cover shall cover the entire ground between groups of shrubs, trees, or grasses and grasses are not considered ground cover. Limited compartments of grasses are acceptable as approved on the planting plans. In

Shrubs and Trees 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 by 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. In Zone 'A' full growth tree branches are not allowed within 10 feet of enclosed combustible structures.

Vertical Separation

Shrubs and Trees Less than 10 Feet in Height:

- When the fuel modification zone is within 30 feet of the structure, a vertical separation of 2 feet is required from the vegetation below. (Not required if shrubs are further than 30 feet from structure).

Shrubs and Trees 10 Feet in Height or Greater:

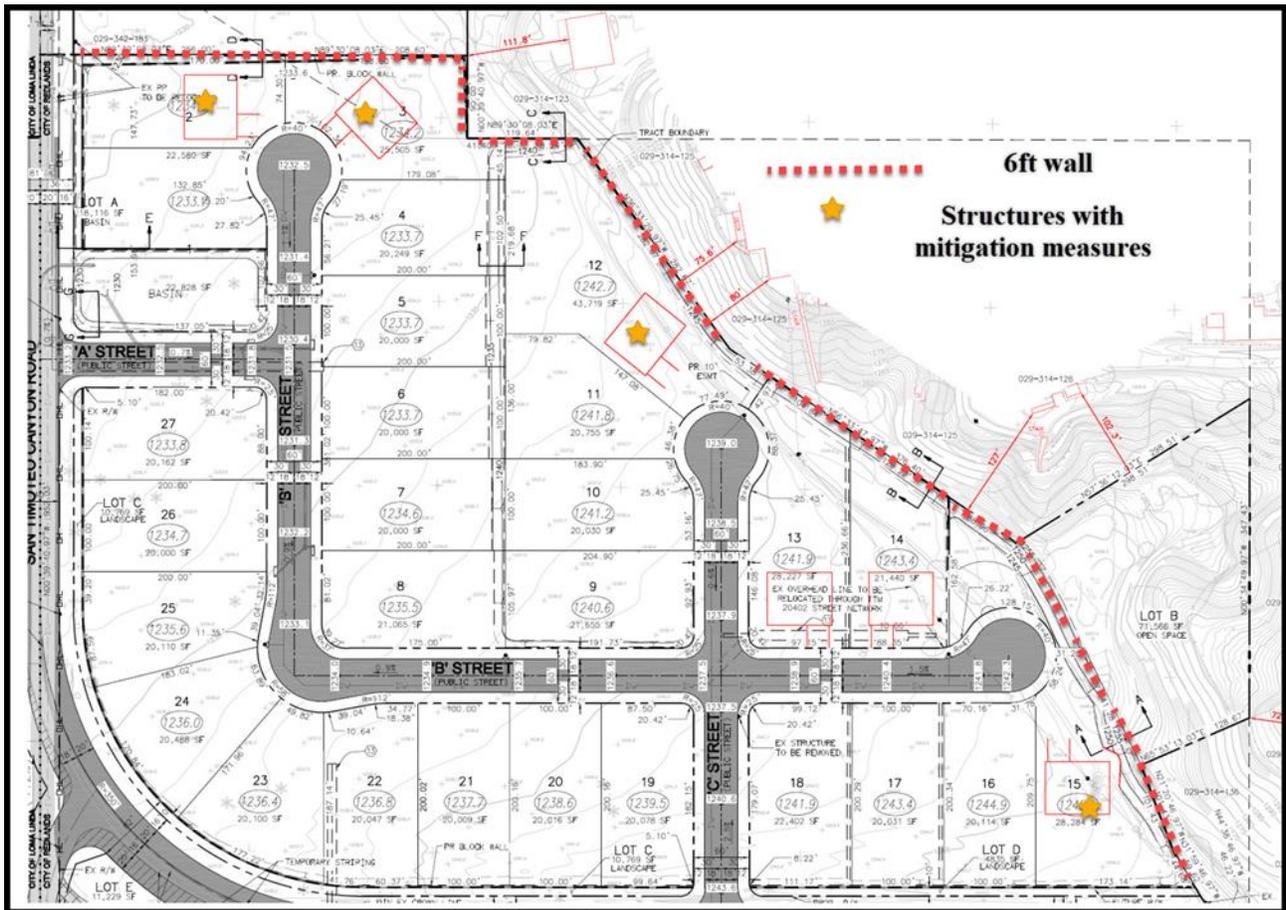
- A vertical separation of 4 feet minimum is required to be maintained from the vegetation below.
- Trees only: All vegetation located underneath trees, shall be a maximum of 2 feet in height.

5.3 Construction Standards

All structures within the development site shall meet all wildland/interface standards to the satisfaction of the Redlands Fire Department (RFD) Fire Marshal. Design and construction shall meet the requirements listed in the 2019 Edition of the Fire and Building Codes, with special adherence to Chapter 7A, and the 2019 Edition of the California Residential Code section R337, with other local amendments/ordnances as adopted by RFD.

For a description of the current construction requirements as of the date of this report (see APPENDIX 'E').

5.3.1 Mitigation Measures for those lots with less than 100ft shall apply as specified.



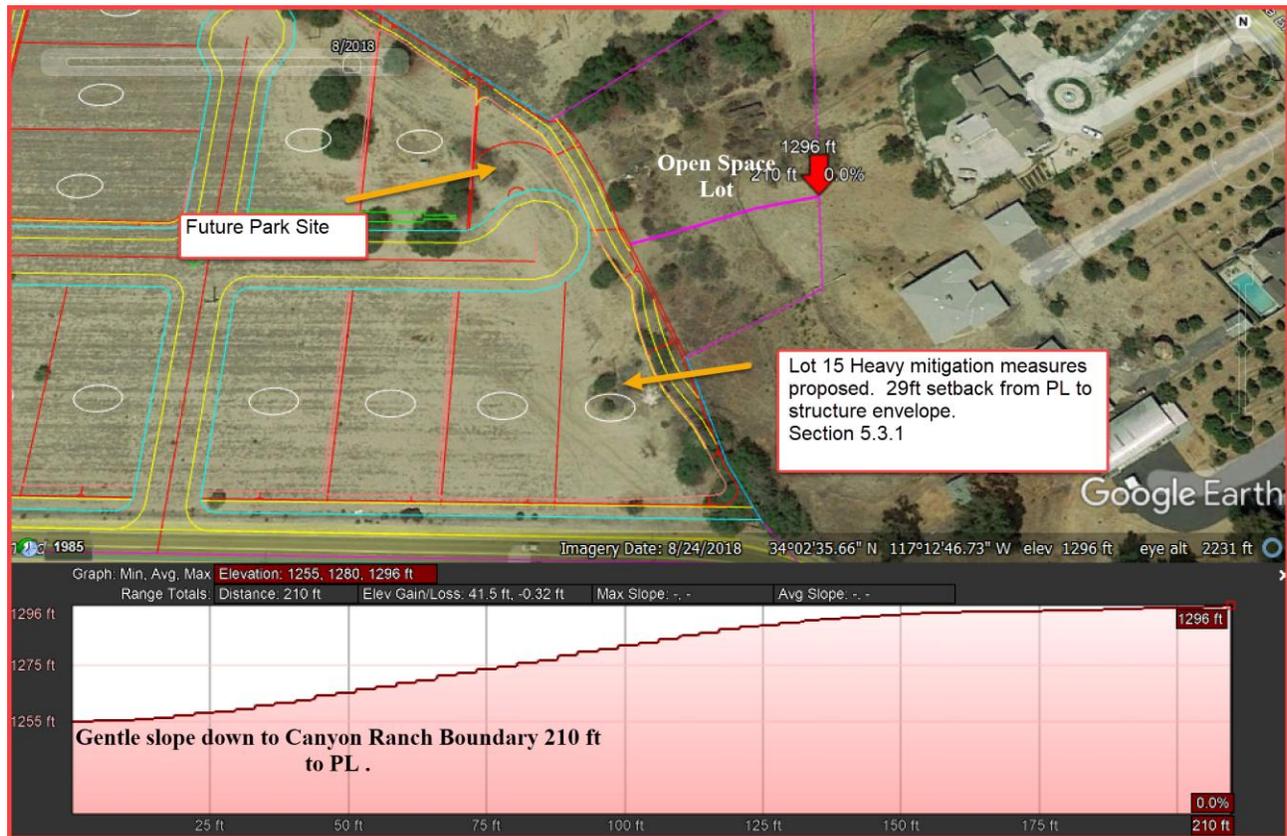
- **Lots 2, 3, 12, 14 and 15** Fire sprinklers shall be installed in the attic space, garage, and small space areas. (closets, storage etc.) Fire sprinklers will require a four (4) head calculation for the sprinkler design. The four head calculation must have a minimum .05 density design, QR and intermediate temperature heads; the heads may be of a small orifice type such as 3/8 or 7/16. Listed domestic demand shutoff valves may be used to try to minimize upgrading meter sizes where possible. CPVC will only be permitted in the attic if listed heads are used to protect piping in accordance with their listing.
- **Lots 2, 3, 12, 14 and 15** Paper-faced insulation shall be prohibited in attics or ventilated spaces.
- **Lots 2, 3, 12, 14 and 15** All operable windows shall be provided with metal mesh bugs screens or similar non-combustible screens over the operable opening to replace traditional vinyl bug screens to prevent embers from entering the structure during high wind conditions when windows may be inadvertently left open.

- **Lots 2, 3, 12, 14 and 15** All foam forms shall be placed over the brown coat and for appendages such as shutters must have a factory applied ignition resistant material on all sides.

For the following lots that have minimal setbacks of the structure envelope to PL.

- **Lots 2, 3, 12 and 15** Exterior walls facing the open space shall be two (2) hour fire resistance rated tested in accordance with ASTM E119 or UL263 with one layer of 5/8-inch Type X gypsum sheathing on interior and exterior surfaces to prevent exposure from both sides and shall have no underfloor or attic vent openings. Stucco shall be applied over the gypsum wall assembly.

Lot 14 and 15 overview of site and location to open space



All accessory structures such as decks, balconies, patios, covers, gazebos and fences shall be built from non-combustible or ignition resistant materials. The homeowner(s) are not restricted from having concrete patios, concrete walkways or swimming pools within the Vegetation Management Zones in compliance with other codes. Refer to APPENDIX 'D' for photos and descriptions of non-combustible decks, patio covers, and railings for these accessory structures.

5.3.2 Construction or building permits shall not be issued until the fire code official inspects and approves required vegetation clearance, fire apparatus access and water supply for the construction site. The issuance of building permits with regard to these requirements shall be in accordance with the City of Redlands Fire Department. Prior to the delivery of combustible building construction materials to the project site the following conditions shall be completed to the satisfaction of RFD.

- All wet and dry utilities shall be installed and approved by the appropriate inspecting department or agency.
- Clearance of Zone 1, and 2 vegetation management shall be provided prior to combustible material arriving on the site and shall be maintained throughout the duration of construction. Fire code officials may require additional vegetation management and/or defensible space when warranted.

- Additional requirements as listed in the development will be adhere to:
 - a. Mobile stationary or portable powered operated equipment in the HFA shall not be used without written approval. Specific fire protection measures that may be required to mitigate the hazard include, but are not limited to:
 1. A standby water tender, equipped with a pump, fire hose and nozzle.
 2. Pre-wetting of the site to avoid the production of sparks between blades, tracks and rocks.
 3. Conducting a fire watch for a minimum of one-hour following the cessation of operations each day
 4. For welding cutting or grinding work, clear away all combustible material from the area around such operations for a minimum distance of 10 feet. A hot-work permit may be required prior to commencing work.
 5. Maintain a serviceable round point shovel with an overall length of not less than forty-six (46) inches and a five (5) gallon backpack water pump-type fire extinguisher fully equipped and ready for use at the immediate area during the operation.

6.0 INFRASTRUCTURE

6.1 Water Supply

The Developments water supply will be provided by the City of Redlands Municipal Utilities. Fire flow requirements shall be provided by RFD. All homes will require NFPA 13D Residential Sprinklers, engineered to the satisfaction of RFD.

6.2 Access Roads/Driveways and Gates

Fire access roads shall meet the requirements of the City of Redlands Design Manual or Guidelines, and shall be a paved surface capable of supporting loads of 80,000 lbs gross vehicle weight. Access to all portions of the building must be within 150 feet of the available fire department access. Fire access roads shall be maintained for clear access of emergency vehicles. The proposed development requires primary and secondary access at the time of construction.

Any gates to be installed shall meet City of Redlands standards and shall be approved by RFD prior to fabrication and installation. City of Redlands requirements are an Opticom eye installed in both directions and a Knox key switch on both sides of the gate. All gates must meet the requirements of UL 325 and ASTM F2200.

7.0 HOMEOWNER’S ASSOCIATION INFORMATION

This plan, related Zone Requirement Exhibit with future ongoing maintenance requirements shall be referenced in any HOA CC&R document that is prepared.

- The HOA CC&R’s will provide a requirement to establish Canyon Ranch as a Firewise community. Additionally, language shall be added to require annually community outreach information, meetings, and inspections of Tract 20402 to the requirements of the FPP. Redlands Fire Department– Fire Marshal will be a technical expert and be a part of the Firewise Community Group. (<https://www.nfpa.org/Public-Education/Fire-causes-and-risks/Wildfire/Firewise-USA>)

7.1 Homeowners Education

The homeowner, by reviewing this Fire Protection Plan, shall be aware of the herein described fire protection measures; the types of non-combustible construction; and the plant materials that are allowed within their lot boundary. Of importance are APPENDICES ‘A’, ‘B’, and ‘D’ of this plan, which provide guidance in the types of plants that are allowed to be established in landscaped areas and appropriate construction within Vegetation Management Zones. Plant selection is critical as embers often travel over a mile during Santa Ana wind events.

- Should a wildland fire occur within the geographical area, the homeowner should understand the established evacuation process. The following web site is a good source of information <https://www.readyforwildfire.org/prepare-for-wildfire/go-evacuation-guide/> procedures recommended by the City of Redlands Fire Department and CalFire. This link provides an overview of the ”Go” principle <https://www.youtube.com/watch?v=Ti5REYefIRA>

- To receive official emergency notifications from City of Redlands such as wildfire incident information, evacuation information, and other critical updates, please sign up for the City of Redlands Emergency Notification System at www.cityofredlands.org/post/emergency-notification-system.

8.0 FIRE PROTECTION PLAN EXHIBIT

The FIRE PROTECTION PLAN EXHIBIT, Is a part of the Plan and depicts the location of all proposed vegetation management treatment locations as well as fire access roads, property lines, proposed hydrant locations and other pertinent information.

APPENDICES

Acceptable Plant List

Undesirable Plant Species

Literature Referenced

Non-combustible & Fire-Resistant Building Materials

Ignition Resistant Construction Requirements

Behave Worksheets

APPENDIX ‘A’

APPENDIX ‘B’

APPENDIX ‘C’

APPENDIX ‘D’

APPENDIX ‘E’

APPENDIX ‘F’

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APPENDIX 'A'
Approved Plant List for the High Fire Hazard Areas

*Defensible Space Landscaping – Plant Pallet for Fuel Modification in Riverside,
Orange and San Diego Counties*

	Code	Botanical Name	Common Name	Plant Form
1.	W	<i>Abelia x grandiflora</i>	Glossy Abelia	Shrub
2.		<i>Acacia redolens</i> desert carpet	Desert Carpet	Shrub
3.		<i>Acer macrophyllum</i>	Big Leaf Maple	Tree
4.	X	<i>Achillea millefolium</i>	Common Yarrow	Low shrub
5.	W	<i>Achillea tomentosa</i>	Wolly Yarrow	Low shrub
6.	X	<i>Aeonium decorum</i>	Aeonium	Ground cover
7.	X	<i>Aeonium simsii</i>	Aeonium	Ground cover
8.	W	<i>Agave attenuata</i>	Century Plant	Succulent
9.	W	<i>Agave shawii</i>	Shaw's Century Plant	Succulent
10.	N	<i>Agave victoriae-reginae</i>	Agave	Ground cover
11.	X	<i>Ajuga reptans</i>	Carpet Bugle	Ground cover
12.	W	<i>Alnus cordata</i>	Italian Alder	Tree
13.		<i>Alnus rhombifolia</i>	White Alder	Tree
14.	N	<i>Aloe aborescens</i>	Torch Aloe	Shrub
15.	N	<i>Aloe aristata</i>	Dwarf Aloe	Ground cover
16.	N	<i>Aloe brevifolia</i>	Aloe	Ground cover
17.	W	<i>Aloe Vera</i>	Medicinal Aloe	Succulent
18.	W	<i>Alyogyne huegelii</i>	Blue Hibiscus	Shrub
19.		<i>Ambrosia chamissonis</i>	Beach Bur-Sage	Perennial
20.		<i>Amorpha fruticosa</i>	Western False Indigobush	Shrub
21.	W	<i>Anigozanthus flavidus</i>	Kangaroo Paw	Perennial Accent
22.		<i>Antirrhinum nuttalianum</i> ssp. <i>Nuttatianum</i>	Beard Tongue	Subshrub
23.	X	<i>Aptenia cordifolia</i> x 'Red Apple'	Red Apple Aptenia	Ground cover
24.	W	<i>Arbutus unedo</i>	Strawberry Tree	Tree
25.	W	<i>Arctostaphylos</i> 'Pacific Mist'	Pacific Mist Manzanita	Ground cover
26.	W	<i>Arctostaphylos edmundsil</i>	Little Sur Manzanita	Ground cover
27.		<i>Arctostaphylos glandulosa</i>	Eastwood Manzanita	Shrub
28.	W	<i>Arctostaphylos hookeri</i> 'Monterey Carpet'	Monterey Carpet Manzanita	Low shrub
29.	N	<i>Arctostaphylos pungens</i>	Heather	Shrub
30.	N	<i>Arctostaphylos refugioensis</i>	Refugio Manzanita	Shrub
31.	W	<i>Arctostaphylos uva-ursi</i>	Bearberry	Ground cover
32.	W	<i>Arctostaphylos</i> x 'Greensphere'	Greensphere Manzanita	Shrub
33.	N	<i>Artemisia caucasia</i>	Caucasian Artemisia	Ground cover
34.	N	<i>Artemisia pycnocephala</i>	Beach Sagewort	Perennial
35.	X	<i>Atriplex canescens</i>	Four-Wing Saltbush	Shrub
36.	X	<i>Atriplex lentiformis</i> ssp. <i>Breweri</i>	Brewer Saltbush	Shrub
37.		<i>Baccharis emoryi</i>	Emory Baccharis	Shrub
38.	W	<i>Baccharis pilularis</i> ssp. <i>Consanguinea</i>	Chaparral Bloom	Shrub

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	Code	Botanical Name	Common Name	Plant Form
39.	X	Baccharis pilularis var. pilularis 'Twin Peaks #2'	Twin Peaks	Ground cover
40.		Baccharis salicifolia	Mulefat	Shrub
41.	N	Baileya Multiradiata	Desert Marigold	Ground cover
42.	W	Beaucarnea recurvata	Bottle Palm	Shrub/Small tree
43.	N	Bougainvillea spectabilis	Bougainvillea	Shrub
44.	N	Brahea armata	Mexican Blue Palm, Blue Hesper Palm	Palm
45.	N	Brahea brandegeei	San Jose Hesper Palm	Palm
46.	N	Brahea edulis	Guadalupe Palm	Palm
47.		Brickellia californica	Hoary Nettle	Subshrub
48.	W	Bromus carinatus	California Brome	Grass
49.		Camissonia cheiranthifolia	Beach Evening Primrose	Perennial subshrub
50.	N	Carissa macracarpa	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 'Louise 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.		Ceanothus megacarpus	Big Pod Ceanothus	Shrub
57.	W	Ceanothus prostratus	Squaw Carpet Ceanothus	Shrub
58.		Ceanothus spinosus	Green Bark Ceanothus	Shrub
59.	W	Ceanothus verrucosus	Wart-Stem Ceanothus	Shrub
60.	W	Cerastium tomentosum	Snow-in-summer	Ground cover/shrub
61.	W	Ceratonia siliqua	Carob	Tree
62.	W	Cercis occidentalis	Western redbud	Tree/Shrub
63.	X	Chrysanthemum leucanthemum	Oxeye Daisy	Groundcover
64.	W	Cistus hybridus	White Rockrose	Shrub
65.	W	Cistus incanus	Mauve Rockrose	Shrub
66.	W	Cistus incanus salviafolius	Sageleaf Rockrose	Shrub
67.	W	Cistus purpureus	Orchid Rockrose	Shrub
68.	W	Citrus species	Citrus	Tree
69.		Clarkia bottae	Showy Fairwell to Spring	Annual
70.		Cneoridium dumosum	Bushrue, Pt. Reyes Ceanothus	Shrub
71.		Collinsia heterophylla	Chinese Houses	Annual
72.	W	Comarostaphylis diversifolia	Summer Holly	Shrub
73.	N	Convolvulus cneorum	Bush Morning Glory	Shrub
74.	W	Coprosma kirkii	Creeping Coprosma	Ground cover/Shrub
75.	W	Coprosma pumila	Prostrate Coprosma	Low Shrub
76.		Coreopsis californica	California coreopsis	Annual
77.	W	Coreopsis lanceolata	Coreopsis	Ground cover

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	Code	Botanical Name	Common Name	Plant Form
78.	N	<i>Correa pulchella</i>	Australian Fuchsia	Ground cover
79.	W	<i>Cotoneaster buxifolius</i>	Grayleaf Cotoneaster	Shrub
80.	W	<i>Cotoneaster congestus</i> Likiang	Likiang Cotoneaster	Ground cover/Vine
81.	X	<i>Crassula lactea</i>	Taylor's Parches	Ground cover
82.	X	<i>Crassula ovata</i>	Jade Tree	Shrub
83.	X	<i>Crassula tetragona</i>	Jade Plant	Shrub
84.	W	<i>Croton californicus</i>	California Croton	Ground cover
85.	X	<i>Delosperma 'alba'</i>	White Trailing Ice Plant	Ground cover
86.		<i>Dendromecon rigida</i>	Bush Poppy	Shrub
87.		<i>Dichelostemma capitatum</i>	Blue Dicks	Herb
88.	N	<i>Distictis buccinatoria</i>	Blood-Red Trumpet Vine	Vine/Climbing vine
89.	N	<i>Dodonaea viscosa</i>	Hopseed Bush	Shrub
90.	X	<i>Drosanthemum floribundum</i>	Rosea Ice Plant	Ground cover
91.	X	<i>Drosanthemum hispidum</i>	Ice Plant, Showy Dewflower	Ground cover
92.		<i>Dudleya lanceolat</i>	Lance Leaved Dudleya	Succulent
93.		<i>Dudleya pulverulenta</i>	Chalk Dudleya	Succulent
94.	W	<i>Elaeagnus pungens</i>	Silverberry	Shrub
95.		<i>Encelia californica</i>	California Encelia	Small shrub
96.	Λ	<i>Epilobium canum</i> (<i>Zauschneria californica</i>)	Hoary California Fuchsia	Shrub
97.		<i>Eriastrum saphirinum</i>	Mojave Woolly Star	Annual
98.	N	<i>Eriobotrya japonica</i>	Loquat	Tree
99.		<i>Eriodictyon crassifolium</i>	Thick-Leaf Yerba Santa	Shrub
100.		<i>Eriodictyon trichocalyx</i>	Mojave Woolly Star	Annual
101.	W	<i>Eriophyllum confertiflorum</i>	Golden Yarrow	Shrub
102.	W	<i>Erythrina species</i>	Coral Tree	Tree
103.	W	<i>Eschscholzia californica</i>	California Poppy	Flower
104.	X	<i>Eschscholzia mexicana</i>	Mexican Poppy	Herb
105.	N	<i>Euonymus fortunei</i>	Winter Creeper Euonymus	Ground cover
106.	N	<i>Fiejoa sellowiana</i>	Pineapple Guava	Shrub/Tree
107.	N	<i>Fragaria chiloensis</i>	Wild Strawberry/ Sand Strawberry	Ground cover
108.		<i>Frankenia salina</i>	Alkali Heath	Ground cover
109.	W	<i>Fremontodendron californicum</i>	California Flannelbush	Shrub
110.	X	<i>Gaillardia x grandiflora</i>	Blanketflower	Ground cover
111.	W	<i>Galvezia speciosa</i>	Bush Snapdragon	Shrub
112.	W	<i>Garrya ellipta</i>	Silktassel	Shrub
113.	X	<i>Gazania hybrids</i>	South African Daisy	Ground cover
114.	X	<i>Gazania rigens leucolaena</i>	Trailing Gazania	Ground cover
115.		<i>Gilia capitata</i>	Globe Gilia	Perennial
116.	W	<i>Gilia leptantha</i>	Showy Gilia	Perennial

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	Code	Botanical Name	Common Name	Plant Form
117.	W	<i>Gilia tricolor</i>	Bird's Eyes	Perennial
118.	W	<i>Ginkgo biloba</i>	Maidenhair Tree	Tree
119.		<i>Gnaphalium californicum</i>	California Everlasting	Annual
120.	W	<i>Grewia occidentalis</i>	Starflower	Shrub
121.		<i>Grindelia stricta</i>	Gum Plant	Ground cover
122.	N	<i>Hakea suaveolens</i>	Sweet Hakea	Shrub
123.	W	<i>Hardebergia comptoniana</i>	Lilac Vine	Shrub
124.	N	<i>Helianthemum mutabile</i>	Sunrose	Ground cover/Shrub
125.		<i>Helianthemum scoparium</i>	Rush Rose	Shrub
126.		<i>Heliotropium curassavicum</i>	Salt Heliotrope	Ground cover
127.	X	<i>Helix canariensis</i>	English Ivy	Ground cover
128.	W	<i>Hesperaloe parviflora</i>	Red Yucca	Perennial
129.		<i>Heteromeles arbutifolia</i>	Toyon	Shrub
130.	X	<i>Hypericum calcycinum</i>	Aaron's Beard	Shrub
131.	N	<i>Iberis sempervirens</i>	Edging Candytuft	Ground cover
132.	N	<i>Iberis umbellatum</i>	Globe Candytuft	Ground cover
133.		<i>Isocoma menziesii</i>	Coastal Goldenbush	Small shrub
134.		<i>Isomeris arborea</i>	Bladderpod	Shrub
135.	W	<i>Iva hayesiana</i>	Poverty Weed	Ground cover
136.	N	<i>Jublans californica</i>	California Black Walnut	Tree
137.		<i>Juncus acutus</i>	Spiny Rush	Perennial
138.		<i>Keckiella antirrhinoides</i>	Yellow Bush Penstemon	Subshrub
139.		<i>Keckiella cordifolia</i>	Heart Leaved Penstemon	Subshrub
140.		<i>Keckiella ternata</i>	Blue Stemmed Bush Penstemon	Subshrub
141.	W	<i>Kniphofia uvaria</i>	Red Hot Poker	Perennial
142.	W	<i>Lagerstroemia patersonii</i>	Crape Myrtle	Tree
143.	X	<i>Lampranthus aurantiacus</i>	Bush Ice Plant	Ground cover
144.	X	<i>Lampranthus filicaulis</i>	Redondo Creeper	Ground cover
145.	X	<i>Lampranthus spectabilis</i>	Trailing Ice Plant	Ground cover
146.	W	<i>Lantana camara cultivars</i>	Yellow Sage	Shrub
147.	W	<i>Lantana montevidensis</i>	Trailing Lantana	Shrub
148.		<i>Lasthenia californica</i>	Dwarf Goldfields	Annual
149.	W	<i>Lavandula dentata</i>	French Lavendar	Shrub
150.	W	<i>Leptospermum laevigatum</i>	Australian Tea Tree	Shrub
151.	W	<i>Leucophyllum frutescens</i>	Texas Ranger	Shrub
152.		<i>Leymus condensatus</i>	Giant Wild Rye	Large grass
153.	N	<i>Ligustrum japonicum</i>	Texas Privet	Shrub
154.	X	<i>Limonium perezii</i>	Sea Lavender	Shrub
155.	W	<i>Liquidambar styraciflua</i>	American Sweet Gum	Tree
156.	W	<i>Liriodendron tulipifera</i>	Tulip Tree	Tree

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157.	X	Lonicera japonica ‘Halliana’	Hall’s Japanese Honeysuckle	Vining Shrub
158.		Lonicera subspicata	Wild Honeysuckle	Vining Shrub
159.	X	Lotus corniculatus	Bird’s Foot Trefoil	Ground Cover
160.		Lotus Heermanii	Woolly Lotus	Perennial
161.		Lotus Scoparius	Deerweed	Shrub
162.	W	Lupinus arizonicus	Desert Lupine	Annual
163.	W	Lupinus benthamii	Spider Lupine	Annual
164.		Lupinus bicolor	Sky Lupine	Flowering annual
165.		Lupinus sparsiflorus	Coulter’s Lupine	Annual
166.	W	Lyonothamnus floribundus ssp. Asplenifolius	Fernleaf Ironwood	Tree
167.	W	Macademia integrifolia	Macadamia Nut	Tree
168.	W	Mahonia aquifolium ‘Golden Abundance’	Golden Abundance, Oregon Grape	Shrub
169.	W	Mahonia nevinii	Nevin Mahonia	Shrub
170.		Malacothamnus fasciculatus	Chaparral Marrow	Shrub
171.	X	Makephora luteola	Trailing Ice Plant	Ground cover
172.	W	Maytenus boaria	Mayten Tree	Tree
173.	W	Melaleuca nesophila	Pink Melaleuca	Shrub
174.	N	Metrosideros excelsus	New Zealand Christmas Tree	Tree
175.	*	Mimulus species	Monkeyflower	Flower
176.		Mirabilis californica	Wishbone Bush	Perennial
177.	N	Myoporum debile	Trailing Myoporum	Shrub
178.	N	Myoporum insulare	Boobialla	Shrub
179.	W	Myoporum parvifolium	Creeping Boobialla	Ground cover
180.	W	Myoporum ‘Pacificum’	Trailing Myoporum	Shrub
181.		Nassella [stipa] lepida	Foothill Needlegrass	Ground cover
182.		Nassella [stipa] pulchra	Purple Needlegrass	Ground cover
183.		Nemophila menziesii	Baby Blue Eyes	Annual
184.	X	Nerium oleander	Oleander	Shrub
185.		Oenothera hookeri	California Evening Primrose	Flower
186.	W	Oenothera speciosa	Showy Evening Primrose	Perennial
187.	X	Ophiopogon japonicus	Mondo Grass	Ground cover
188.	*	Opuntia littoralis	Prickly Pear	Cactus
189.	*	Opuntia oricola	Oracle Cactus	Cactus
190.	*	Opuntia prolifera	Coast Cholla	Cactus
191.	W	Osmanthus fragrans	Sweet Olive	Shrub
192.	X	Osteospermum fruticosum	Trailing African Daisy	Ground cover
193.	X	Parkinsonia aculeata	Mexican Palo Verde	Tree
194.	W	Pelargonium peltatum	Ivy Geranium	Ground cover
195.	X	Penstemon species	Beard Tongue	Shrub

X = Plant Species prohibited in wet and dry fuel modification zones adjacent to native open space lands. Acceptable in all other fuel modification zones and locations.

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– = Plant species native to Riverside, Orange and San Diego Counties. Acceptable in all fuel modification (wet or dry zones) in all locations.

N = Plant species acceptable on a limited basis (maximum 30% of the area at time of planting) in wet fuel modification zones adjacent to native open space reserve lands. Acceptable in all other fuel modification zones and locations.

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** = Not native plant species but can be used in all fuel modification zones.

**Defensible Space Landscaping – Plant Pallet for Fuel Modification in Riverside,
Orange and San Diego Counties**

	Code	Botanical Name	Common Name	Plant Form
196.	W	Photinia Fraseri	Red Robin	Shrub
197.	W	Pistacia chinensis	Chinese pistache	Tree
198.	X	Pittosporum undulatum	Victorian Box	Tree
199.		Plantago erecta	California Plantain	Annual
200.	**	Plantago insularis	Woolly Plantain	Annual
201.	X	Plantago sempervirens	Evergreen Plantain	Ground cover
202.	W	Platanus racemosa	California Sycamore	Tree
203.	W	Phumbago auriculata	Phumbago Cape	Shrub
204.		Populus fremontii	Western Cottonwood	Tree
205.	X	Portulacaria afra	Elephant's Foot	Shrub
206.		Potentilla glandulosa	Sticky Cinquefoil	Subshrub
207.	X	Potentilla tabernaemontanii	Spring Cinquefoil	Ground cover
208.	X	Prunus caroliniana	Carolina Cherry Laurel	Shrub/Tree
209.		Prunus ilicifolia ssp. Ilicifolia	Holly Leaved Cherry	Shrub
210.	X	Prunus lyonii	Catalina Cherry	Shrub/Tree
211.	N	Punica granatum	Pomegranate	Shrub/Tree
212.	W	Puya species	Puya	Succulent/shrub
213.	W	Pyracantha species	Firethorn	Shrub
214.		Quercus agrifolia	Coast Live Oak	Shrub
215.	*	Quercus berberdifolia	California Scrub Oak	Shrub
216.	*	Quercus dumosa	Coastal Scrub Oak	Shrub
217.	X	Quercus engelmannii	Engelmann Oak	Tree
218.	X	Quercus suber	Cork Oak	Tree
219.	X	Rhamnus alaternus	Italian Buckthorn	Shrub
220.		Rhamnus californica	California Coffee Berry	Shrub
221.		Rhamnus crocea	Redberry	Shrub
222.		Rhamnus crocea ssp. Ilicifolia	Hollyleaf Redberry	Shrub
223.	N	Rhaphiolepis species	Indian Hawthorn	Shrub
224.		Rhus integrifolia	Lemonade Berry	Shrub
225.	N	Rhus lancea	African Sumac	Tree
226.		Rhus ovataa	Sugarbush	Shrub
227.		Ribes aureum	Golden Currant	Shrub
228.		Ribes indecorum	White Flowering Currant	Shrub
229.		Ribes speciosum	Fuschia Flowering Gooseberry	Shrub
230.	W	Ribes viburnifolium	Evergreen Currant	Shrub
231.	*	Romneya coulteri	Matilija Poppy	Shrub
232.	X	Romneya coulteri 'White Cloud'	White Cloud Matilija Poppy	Shrub
233.	W	Rosmarinus officinalis	Rosemary	Shrub
234.	W	Salvia greggii	Autumn Sage	Shrub

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**Defensible Space Landscaping – Plant Pallet for Fuel Modification in Riverside,
Orange and San Diego Counties**

	Code	Botanical Name	Common Name	Plant Form
235.	W	Salvia sonomensis	Creeping Sage	Ground cover
236.		Sambucus mexicana	Mexican Elderberry	Tree
237.	W	Santolina chamaecyparissis	Lavender Cotton	Ground cover
238.	W	Santolina virens	Green Lavender Cotton	Shrub
239.		Satureja chandleri	San Miguel Savory	Perennial
240.		Scirpus acutus	Hard-Stem Bulrush	Perennial
241.		Scirpus californicus	California Bulrush	Perennial
242.	X	Sedum acre	Goldmoss Sedum	Ground cover
243.	X	Sedum album	Green stonecrop	Ground cover
244.	X	Sedum confusum	Stonecrop	Ground cover
245.	X	Sedum x rubrotinctum	Pork & Beans	Ground cover
246.	X	Senecio serpens	Dusty Miller	Ground cover
247.		Sisyrinchium bellum	Blue-Eyed Grass	Ground cover
248.		Solanum douglasii	Douglas Nightshade	Shrub
249.		Solanum xanthii	Purple Nightshade	Perennial
250.	W	Stenocarpus sinuatus	Firewheel Tree	Tree
251.	W	Strelitzia nicolai	Giant Bird of Paradise	Perennial
252.	W	Strelitzia reginae	Bird of Paradise	Perennial
253.		Symphoricarpos mollis	Creeping Snowberry	Shrub
254.	W	Tecoma stans [stenolibium stans]	Yellow Bells	Shrub/small tree
255.	X	Tecomaria capensis	Cape Honeysuckle	Ground cover
256.	N	Teucrium chamaedrys	Germander	Ground cover
257.	N	Thymus serpyllum	Lemon Thyme	Ground cover
258.	N	Trachelospermum jasminoides	Star Jasmine	Shrub
259.		Trichostems lanatum	Wolly Blue-Curls	Shrub
260.	X	Trifolium hirtum 'Hyron'	Hyron Rose Clover	Ground cover
261.	X	Trifolium fragiferum 'O'Connor's'	O'Connor's Legume	Ground cover
262.		Umbellularia californica	California Laurel	Tree
263.		Verbena lasiostachys	Western Vervain	Perennial
264.	N	Verbena peruviana	Peruvian Verbena	Ground cover
265.	X	Verbena species	Verbena	Ground cover
266.	X	Vinca minor	Dwarf Periwinkle	Ground cover
267.		Vitis Girdiana	Desert Wild Grape	Vine
268.	X	Vulpia myuros 'Zorro'	Zorro Annual Fescue	Grass
269.	W	Westringia fruticosa	Coast Rosemary	Shrub
270.	W	Xanthorrhoea species	Grass Tree	Perennial / shrub
271.	W	Xylosma congestum	Shiny Xylosma	Shrub
272.	X	Yucca species	Yucca	Shrub
273.		Yucca whipplei	Yucca	Shrub

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APPENDIX 'B'

PROHIBITED PLANT SPECIES

APPENDIX 'B'

Prohibited (& Fire Prone) Plant Species List For Fuel Modification Zones in High & Very High Hazard Areas

	Botanical Name	Common Name	Plant Form
1.	Acacia species •	Acacia	Shrub/Tree
2.	Adenostema fasciculatum	Chamise	Shrub
3.	Adenostema sparsifolium	Red Shank	Shrub/Tree
4.	Artemisia californica	California Sagebrush	Shrub
5.	Anthemis cotula	Mayweed	Weed
6.	Arundo donax	Giant reed	Grass/weed
7.	Brassica nigra	Black Mustard	Weed
8.	Brassica ropa	Yellow Mustard	Weed
9.	Cedrus species	Cedar	Tree
10.	Cirsim vulgare	Wild Artichoke	Weed
11.	Conyza canadensis	Horseweed	Weed
12.	Cortaderia seloana	Pampas Grass	Tall Grass
13.	Cupressus species	Cypress	Tree
14.	Eriogonum fasciculatum	Common Buckwheat	Shrub
15.	Eucalyptus species	Eucalyptus	Shrub/Tree
16.	Heterotheca grandiflora	Telegraph plant	Weed/shrub
17.	Juniperus species	Junipers	Succulent
18.	Lactuca serriola	Prickly lettuce	Weed
19.	Nicotiana bigelevelil	Indian tobacco	Shrub
20.	Nicotiana glauca	Tree tobacco	Shrub
21.	Pennisetum species	Fountain Grass	Ground cover
22.	Pinus species	Pines	Tree
23.	Rosmarinus species	Rosemary	Shrub
24.	Salvia species • •	Sage	Shrub
25.	Silybum marianum	Milk thistle	Weed
26.	Urtica urens	Burning nettle	Weed
<ul style="list-style-type: none"> • Except: Acacia redolens desert carpet (Desert Carpet ground cover) • • Except: Salvia columbariae (chia) Salvia sonomensis (Creeping Sage) 			

Additionally, all the following plants shall be removed from all zones, to not only reduce fuel loading but also eliminate invasive plants that are identified in the Multiple Species Habitat Conservation Plan.

PLANTS THAT SHOULD BE AVOIDED ADJACENT TO THE MSHCP CONSERVATION AREA

BOTANICAL NAME	COMMON NAME
<i>Acacia</i> spp. (all species)	acacia
<i>Achillea millefolium</i>	var. <i>millefolium</i> common yarrow
<i>Ailanthus altissima</i>	tree of heaven
<i>Aptenia cordifolia</i>	red apple
<i>Arctotheca calendula</i>	OPe weed
<i>Arctotis</i> spp. (all species & hybrids)	African daisy
<i>Arundo donax</i>	giant reed or arundo grass
<i>Asphodelus fistulosus</i>	asphodel
<i>Atriplex glauca</i>	white saltbush
<i>Atriplex semibaccata</i>	Australian saltbush
<i>Carex</i> spp. (all species*)	sedge
<i>Carpobrotus chilensis</i>	ice plant
<i>Carpobrotus edulis</i>	sea fig
<i>Centranthus ruber</i>	red valerian
<i>Chrysanthemum coronarium</i>	annual chrysanthemum
<i>Cistus ladanifer</i>	(incl. hybrids/varieties) gum rockrose
<i>Cortaderia jubata</i> [syn. <i>C. Atacamensis</i>]	jubata grass, pampas grass
<i>Cortaderia dioica</i> [syn. <i>C. sellowana</i>]	pampas grass
<i>Cotoneaster</i> spp. (all species)	cotoneaster
<i>Cynodon dactylon</i>	(incl. hybrids varieties) Bermuda grass
<i>Cyperus</i> spp. (all species*)	nutsedge, umbrella plant
<i>Cytisus</i> spp. (all species)	broom
<i>Delosperma 'Alba'</i>	white trailing ice plant
<i>Dimorphotheca</i> spp. (all species)	African daisy, OPe marigold
<i>Drosanthemum floribundum</i>	rosea ice plant

<i>Drosanthemum hispidum</i>	purple ice plant
<i>Eichhornia crassipes</i>	water hyacinth
<i>Elaeagnus angustifolia</i>	Russian olive
<i>Eucalyptus</i> spp. (all species)	eucalyptus or gum tree
<i>Eupatorium coelestinum</i> [syn. <i>Ageratina</i> sp.]	mist flower
<i>Festuca arundinacea</i>	tall fescue
<i>Festuca rubra</i>	creeping red fescue
<i>Foeniculum vulgare</i>	sweet fennel
<i>Fraxinus uhdei</i>	(and cultivars) evergreen ash, shamel ash
<i>Gaura</i> (spp.) (all species)	gaura
<i>Gazania</i> spp. (all species & hybrids)	gazania
<i>Genista</i> spp. (all species)	broom
<i>Hedera canariensis</i>	Algerian ivy
<i>Hedera helix</i>	English ivy
<i>Hypericum</i> spp. (all species)	St. John's Wort
<i>Ipomoea acuminata</i>	Mexican morning glory
<i>Lampranthus spectabilis</i>	trailing ice plant
<i>Lantana camara</i>	common garden lantana
<i>Lantana montevidensis</i> [syn. <i>L. sellowiana</i>]	lantana
<i>Limonium perezii</i>	sea lavender
<i>Linaria bipartita</i>	toadflax
<i>Lolium multiflorum</i>	Italian ryegrass
<i>Lolium perenne</i>	perennial ryegrass
<i>Lonicera japonica</i>	(incl. 'Halliana') Japanese honeysuckle
<i>Lotus corniculatus</i>	birdsfoot trefoil
<i>Lupinus arboreus</i>	yellow bush lupine
<i>Lupinus texanus</i>	Texas blue bonnets
<i>Malephora crocea</i>	ice plant
<i>Malephora luteola</i>	ice plant
<i>Mesembryanthemum nodiflorum</i>	little ice plant

<i>Myoporum laetum</i>	myoporum
<i>Myoporum pacificum</i>	shiny myoproum
<i>Myoporum parvifolium</i>	(incl. 'Prostratum') ground cover myoporum
<i>Oenothera berlandieri</i>	Mexican evening primrose
<i>Olea europea</i>	European olive tree
<i>Opuntia ficus-indica</i>	Indian fig
<i>Osteospermum spp. (all species)</i>	trailing African daisy, African daisy,
<i>Oxalis pes-OPrae</i>	Bermuda buttercup
<i>Parkinsonia aculeata</i>	Mexican palo verde
<i>Pennisetum clandestinum</i>	Kikuyu grass
<i>Pennisetum setaceum</i>	fountain grass
<i>Phoenix canariensis</i>	Canary Island date palm
<i>Phoenix dactylifera</i>	date palm
<i>Plumbago auriculata</i>	OPe plumbago
<i>Polygonum spp. (all species)</i>	knotweed
<i>Populus nigra 'italica</i>	' Lombardy poplar
<i>Prosopis spp. (all species*)</i>	mesquite
<i>Ricinus communis</i>	castorbean
<i>Robinia pseudoacacia</i>	black locust
<i>Rubus procerus</i>	Himalayan blackberry
<i>Sapium sebiferum</i>	Chinese tallow tree
<i>Saponaria officinalis</i>	bouncing bet, soapwart
<i>Schinus molle</i>	Peruvian pepper tree, California pepper
<i>Schinus terebinthifolius</i>	Brazilian pepper tree
<i>Spartium junceum</i>	Spanish broom
<i>Tamarix spp. (all species)</i>	tamarisk, salt cedar
<i>Trifolium tragiferum</i>	strawberry clover
<i>Tropaelolum majus</i>	garden nasturtium
<i>Ulex europaeus</i>	prickly broom
<i>Vinca major</i>	periwinkle
<i>Yucca gloriosa</i>	Spanish dagger

An asterisk (*) indicates some native species of the genera exist that may be appropriate.

Sources: California Exotic Pest Plant Council, United States Department of Agriculture-Division of Plant Health and Pest Prevention Services, California Native Plant Society, Fremontia Vol. 26 No. 4, October 1998, The Jepson Manual; Higher Plants of California, and County of San Diego-Department of Agriculture.

APPENDIX ‘C’

REFERENCE MATERIAL

Literature References

1. *Standard Fire Behavior Fuel Models: A Comprehensive Set for Use with Rothermel’s Surface Fire Spread Model*, General Technical Report RMRS-GTR-153. June 2005. Joe H. Scott, Robert E. Burgan, United States Department of Agriculture - Forest Service, Rocky Mountain Research Station, Missoula, Montana.
2. *BEHAVEPlus: Fire Modeling System, version 5.0.5: Variables*. General Technical Report RMRS-GTR-213WWW Revised. September 2009. Patricia L. Andrews, United States Department of Agriculture - Forest Service, Rocky Mountain Research Station, Missoula, Montana.
3. *BEHAVEPlus Fire Modeling System, Version 5.0.0* General Technical Report RMRS-GRT-106WWW Revised. June 2008. Patricia L. Andrews, Collin D. Bevins and Robert C. Seli. United States Department of Agriculture - Forest Service, Rocky Mountain Research Station, Missoula, Montana.
4. *BEHAVEPlus Fire Modeling System, Version 5.0 User’s Guide*. General Technical Report RMRS-GRT-106WWW Revised. July, 2009. Patricia L. Andrews, Collin D. Bevins, Robert C. Seli. United States Department of Agriculture - Forest Service, Rocky Mountain Research Station, Missoula, Montana.
5. The 2019 California Fire Code Chapter 49
6. The 2019 California Fire Code with Local Amendments
7. The 2019 California Residential Code, Section R337.
8. Chapter 7A-California of the 2019 Building Code
9. National Fire Protection Association - NFPA 13 Standard for the Installation of Sprinkler Systems in One – and Two-Family Dwellings and Manufactured Homes, 13-R &13-D, 2019 Editions
10. National Fire Protection Association - NFPA 1144 *Standard for Reducing Structure Ignition Hazards from Wildfire* (2018).
11. *The California State and Local Responsibility Area Fire Hazard Severity Zone Map – Fire and Resource Assessment Program of CAL FIRE*
15. Western Region Climate Center. *Historic Climate Data from Remote Automated Weather Stations*. RAWs USA Climate Archive. Reno, NV. Data for all Remote Automated Weather Stations is available at: <http://www.raws.dri.edu/index.html>

APPENDIX 'D'

Non-combustible & Ignition Resistant Building Materials

Non-Combustible & Ignition Resistant Building Materials For Balconies, Carports, Decks, Patio Covers and Floors

Examples of non-combustible & fire resistant building materials for balconies, carports decks, patio covers and floors are as follow:

I. **NON-COMBUSTIBLE HEAVY GAGE ALUMINUM MATERIALS** - *Metals USA Building Products Group - Ultra-Lattice*



Ultra-Lattice Stand Alone Patio Cover



Ultra-Lattice Attached Patio Cover



Ultra-Lattice Solid Patio Cover



Ultra-Lattice Vs. Wood

II. FRX Exterior Fire-Retardant Treated Wood

Exterior Fire Retardant Treated (FRT) Wood

FRX® fire retardant treated wood may be used in exterior applications permitted by the codes where: public safety is critical, other materials would transfer heat or allow fires to spread, sprinkler systems cannot easily be installed, corrosive atmospheres necessitate excessive maintenance of other materials, or fire protection is inadequate or not readily available. The International Building, Residential and Urban-Wildland Interface Codes and regulations permit the use of fire retardant treated wood in specific instances. See below for typical exterior uses and typical residential uses.

Typical Exterior Uses

- Balconies
- Decks



Homeowners and Residential Architects: See this [2-minute video](#) and the diagram below.

For information on fire retardant treated wood for exterior uses, visit www.frxwood.com.

“Trex Accents ®: Fire Defense™” wood and polyethylene composite deck board, nominal 5/4” thick x 5-1/2” width, nominal density of 0.036 lb./in³.

Trex Accents®: Fire Defense™

The perfect blend of beauty and brawn.

Trex's #1 selling platform, Trex Accents®, exceeds the strict fire regulations set by the State of California and San Diego County.



- Offers superior safety performance:
 - Exceeds ASTM E84 Class B Flame Spread.
 - Exceeds 12-7A-4 Part A (underflame) and Part B (Burning Brand).
- Self-extinguishing even under extreme fire exposure.

Approved for use by the California State Fire Marshal's Office and San Diego County. Read the California Department of Forestry and Fire Protection, Office of the State Fire Marshal [WILDLAND URBAN INTERFACE \(WUI\) PRODUCTS Report](#). (PDF)

IV. SOLID “WOOD” DECKING

Company Name: Various Manufacturers

Product Description: Solid “Wood” decking: “Redwood”, “Western Red Cedar”, “Incense Cedar”, “Port Orford Cedar”, and “Alaska Yellow Cedar”.

Sizes: Minimum nominal 2” thickness (American Softwood Lumber Standard PS 20).

Lumber grades: Construction Common and better grades for Redwood, 3 Common and better grades for Cedars, and commercial decking or better grades for both Redwood and Cedars.

Special Instructions: Solid wood decking shall be installed over solid wood joists spacing 24” or less on center.

Decking (SFM Standard 12-7A-4)

V. Vents

Examples of Approved Vents

Brandguard



O’Hagin Fire & Ice® Line – Flame and Ember Resistant

An available option for all O’Hagin attic ventilation products, this attic vent not only features all the same design, construction elements and color choices as the O’Hagin Standard Line, but also features an interior stainless-steel matrix that resists the intrusion of flames and embers. This patent-pending attic vent is accepted for use by many local fire officials for installation in Wildland Urban Interface (WUI) zones.



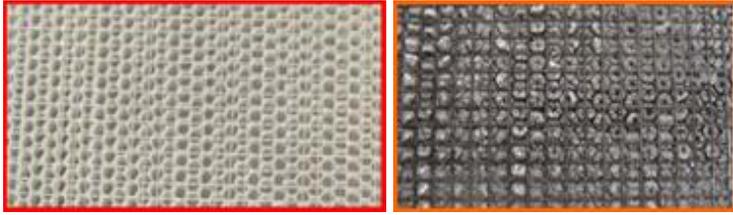
Vulcan Vents

The founders of Gunter Manufacturing have been working closely over the last two years, with the scientists and inventors of Vulcan Technologies to bring to market this incredible product.

Combining our quality vent products with the fire-stopping honeycomb matrix core designed by Vulcan has produced unique and remarkable results.

At Gunter manufacturing has over 50 years of combined sheet metal manufacturing experience. Special orders are not a problem. Their vent frames are industry standard frames so there is little or no learning curve for installers and contractors. Their stated goal is to provide people with the vents they need to secure their homes with additional safety against wildfires and give them piece of mind from knowing that their home or structure is protected by a product that works!

The core of their fire and ember safe vents are manufactured out of hi-grade aluminum honeycomb and coated with an intumescent coating made by [FireFree Coatings](#). The intumescent coating is designed to quickly swell up and close off when exposed to high heat. The expanded material acts as an insulator to heat, fire, and embers



Before

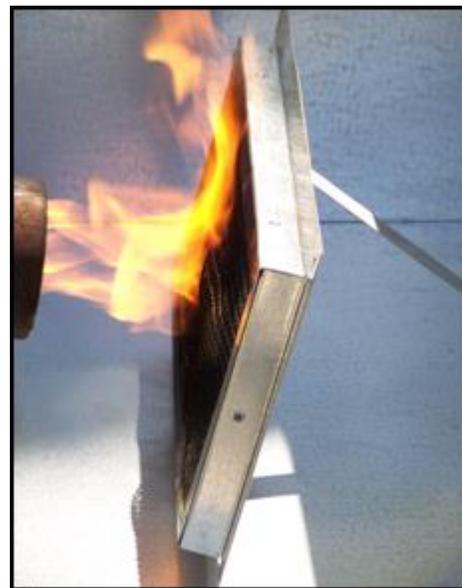
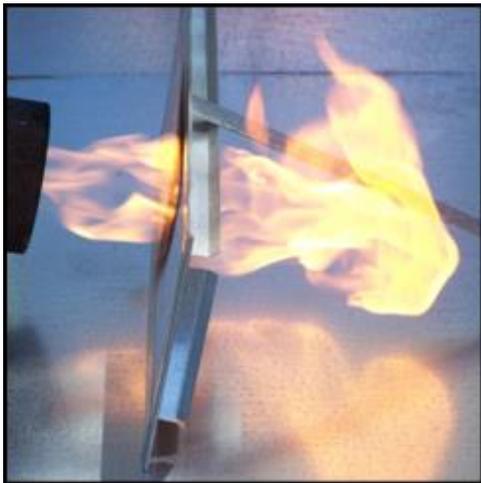
After

After the cells close off, they are extremely well insulated, and fire or embers cannot penetrate.

Even before the cells close off, the vent is designed to protect against flying embers. In many cases embers will attack a structure before fire ever comes near, so this feature is very important.



Close-up of the coated honeycomb matrix.



Fire easily passes through a standard vent, on the left, but stops cold when it comes up against a Vulcan Vent shown on right.

APPENDIX 'E'

Ignition Resistant Construction

As of the date of this FPP, the following is an edited list of ignition resistant construction requirements for buildings located in an Wildland Urban Interface Fire Area under the California Fire Code (CFC), Chapter 7A of the California Building Code (CBC) and the California Residential Code (CRC) R337. However the requirements listed below are not all inclusive and all exterior building construction including roofs, eaves, exterior walls, doors, windows, decks, and other attachments shall meet, in full, all of the CBC Chapter 7A ignition resistance requirements, CRC R337, CFC requirements and all current applicable codes and any exceptions or local requirements in force at the time of building permit application.

1. Ventilation openings for enclosed attics, soffit spaces, rafter spaces formed where ceilings are applied directly to the underside of the roof rafters, and underfloor ventilation openings shall be fully covered with metal wire mesh, vents, other materials or other devices that are corrosion-resistant, a minimum of 1/16 inch and not exceed 1/8-inch and are non-combustible. Vents located under the roof covering, along the ridge of roofs, with the exposed surface of the vent covered by non-combustible wire mesh may be of combustible materials.
2. Vents shall not be installed on the underside of eaves and cornices except vents meeting the requirements of Item 1 may be installed if the attic space is protected by interior fire sprinklers or the exterior wall covering and exposed underside of the eave are of noncombustible or ignition resistant materials and the vent is located more than 12 feet from the ground or walking surface of a deck, porch, patio or similar surface.
3. The enforcing agency may approve special eave or cornice vents that resist intrusion of flame and burning embers.
4. Paper-faced insulation shall be prohibited in attics or ventilated spaces.
5. Where valley flashing is installed, the flashing shall not be less than 0.019 inch No. 26 gage galvanized sheet corrosion resistant metal installed over not less than one layer of minimum 72 pound mineral surfaced non-perforated OP sheet complying with ASTM D 3909 at least 36 inch wide running the full length of the valley.
6. Rain gutters shall be provided with the means to prevent the accumulation of leaf litter and debris that contribute to roof edge ignition.
7. All rain gutters, down spouts and gutter hardware shall be constructed from metal or other noncombustible material to prevent wildfire ignition along eave assemblies.

8. All structures will be built with a Class A roof assembly, including a Class A roof covering.
9. Where the roof profile allows a space between the roof covering and roof decking, the spaces shall be constructed to prevent the intrusion of flames and embers, be fire stopped with approved materials or have one layer of minimum No. 72 mineral surfaced on-perforated ASTM D 3909 OP sheet installed over the combustible decking.
10. The exposed roof deck on the underside of unenclosed roof eaves shall be protected by either non-combustible material; ignition resistant material; one layer of 5/8 inch Type X gypsum on the underside exterior; or 1-hour fire resistive exterior wall assembly applied to the underside of roof deck. Solid wood rafter tails with a 2 inch nominal minimum dimension; solid wood blocking installed between rafter tails with a 2 inch nominal minimum dimension; gable end overhangs and roof assembly projections beyond an exterior wall other than the lower end of the rafter tails; fascia; and other architectural trim boards do not require protection.
11. The exposed underside of roof eaves and roof eave soffits shall be protected by either non-combustible material; ignition resistant material; one layer of 5/8 inch Type X gypsum on the underside exterior; or 1-hour fire resistive exterior wall assembly applied to the underside of rafter tails or soffits. Gable end overhangs and roof assembly projections beyond an exterior wall other than the lower end of the rafter tails, fascia, and other architectural trim boards do not require protection.
12. The exposed underside of porch ceilings and the exposed underside of cantilevered floor projections where a floor assembly extends over an exterior wall shall be protected by non-combustible material, ignition resistant material, one layer of 5/8 inch Type X gypsum on the underside exterior, or 1-hour fire resistive exterior wall assembly applied to the underside of the porch ceilings or floor projections. Architectural trim boards do not require protection.
13. All chimney, flue or stovepipe openings will have an approved spark arrester. An approved spark arrester is defined as a device constructed of nonflammable materials, 12-gauge minimum thicknesses or other material found satisfactory by the FAHJ, having 1/2-inch perforations for arresting burning carbon or sparks. It shall be installed to be visible for the purposes of inspection and maintenance.
14. All structures will have automatic interior fire sprinklers designed and installed according to the National Fire Protection Association (NFPA) 13 - Standard for the Installation of Sprinkler Systems.
15. All exterior windows and exterior glazed door assemblies or other transparent, translucent or opaque glazing materials including skylights shall be constructed multi-layered glazed panels one layer of which must be tempered glass.
16. The exterior wall covering or assembly shall be non-combustible, ignition resistant, a heavy timber exterior wall assembly or log wall construction assembly and meet the performance criteria set forth in SFM Standard 12-7A-1. Exterior walls coverings shall extend from the top of the foundation to the roof and terminate at 2-inch nominal solid blocking between rafters at all roof overhangs or in the case of enclosed eaves, terminate at the enclosure.

17. Exterior doors shall conform to the performance requirements of standard SFM 12-7A-1, shall have a fire-resistance rating of not less than 20 minutes when tested according to NFPA 252, and shall be of approved non-combustible or ignition resistant material; or constructed of solid core wood having stiles and rails not less than 1³/₈ inches thick with interior field panel thickness no less than 1¹/₄ inches thick.
18. Vinyl window assemblies are deemed acceptable if the windows have the following characteristics:
 - Frame and sash are comprised of vinyl material with welded corners
 - Metal reinforcements in the interlock area
 - Glazed with insulating glass, annealed or tempered (one layer of which must be tempered glass)
 - Frame and sash profiles are certified in AAMA Lineal Certification Program
 - Certified and labeled to ANSI/AAMA/NWWDA 101/LS2-97 for Structural Requirements
19. The underfloor area of elevated or overhanging buildings and appendages shall be enclosed to grade and shall be protected by non-combustible material, ignition resistant material, one layer of 5/8 inch Type X gypsum on the underside exterior, or 1-hour fire resistive exterior wall assembly applied to the underside of the exposed underfloor. Heavy timber structural columns and beams are exempt.
20. The walking surface material of decks, porches and stairs shall be constructed of one of the following: ignition resistant material that complies with both SFM Standard 12-7A-4 & 5; exterior fire retardant wood; non-combustible material; any material that complies with SFM Standard 12-7A-4 when attached exterior wall covering is also either non-combustible or ignition resistant material.
21. Detached accessory structures located less than 50 feet from a building containing habitable space shall be constructed in accordance with Chapter 7A of the California Building Code.

Notice to Builder and Architect:

Firewise2000 highly recommends all venting be of the compartmentalized type.

Installation of other types of venting should conform to:

CAL FIRE - Office of the State Fire Marshal Information Bulletin 21-003

Issued: July 8, 2021

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APPENDIX ‘F’

Behave Worksheets

Off Shore Wind Event**Input Worksheet****Inputs: SURFACE**

Input Variables	Units	Input Value(s)
Fuel/Vegetation, Surface/Understory		
First Fuel Model		GS2
Second Fuel Model		SH2
First Fuel Model Coverage	%	60
Fuel Moisture		
1-h Moisture	%	2
10-h Moisture	%	3
100-h Moisture	%	5
Live Herbaceous Moisture	%	30
Live Woody Moisture	%	50
Weather		
20-ft Wind Speed	mi/h	70
Wind Adjustment Factor		.5
Wind Direction (from north)	deg	45
Terrain		
Slope Steepness	%	39
Aspect	deg	270

Notes**Run Option Notes**

Two fuel model weighting method: two-dimensional spread [SURFACE].

Maximum reliable effective wind speed limit IS imposed [SURFACE].

Calculations are only for the direction of maximum spread [SURFACE].

Fireline intensity, flame length, and spread distance are always for the direction of the spread calculations [SURFACE].

Wind and spread directions are degrees clockwise from north [SURFACE].

Wind direction is the direction from which the wind is blowing [SURFACE].

Results

Output Variable	Value	Units
Surface Rate of Spread (maximum)	523.2	ft/min
Fireline Intensity	6924	Btu/ft/s
Flame Length	26.3	ft
Direction of Maximum Spread (from north)	224	deg

End

BehavePlus 5.0.5 (Build 307)

Off Shore Wind Event North end of Project Boundary

Input Worksheet

Inputs: SURFACE

Input Variables	Units	Input Value(s)
Fuel/Vegetation, Surface/Understory		
Fuel Model		gr2
Fuel Moisture		
1-h Moisture	%	2
10-h Moisture	%	3
100-h Moisture	%	5
Live Herbaceous Moisture	%	30
Live Woody Moisture	%	50
Weather		
20-ft Wind Speed	mi/h	70
Wind Adjustment Factor		.5
Wind Direction (from north)	deg	0
Terrain		
Slope Steepness	%	0
Aspect	deg	0

Notes

Run Option Notes

Maximum reliable effective wind speed limit IS imposed [SURFACE].
Calculations are only for the direction of maximum spread [SURFACE].
Fireline intensity, flame length, and spread distance are always for the direction of the spread calculations [SURFACE].
Wind and spread directions are degrees clockwise from north [SURFACE].
Wind direction is the direction from which the wind is blowing [SURFACE].

Results

Output Variable	Value	Units
Surface Rate of Spread (maximum)	368.8	ft/min
Fireline Intensity	1791	Btu/ft/s
Flame Length	14.1	ft
Direction of Maximum Spread (from north)	180	deg

End