Brightwater Development
FIRE PROTECTION PLAN

County of San Diego Tract No. 5306RPL2
Log No. 03-14-007

Lakeside Fire Protection District
County of San Diego

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EXECUTIVE SUMMARY

This Fire Protection Plan (FPP) for the proposed Brightwater Development has been prepared to evaluate the level of fire hazard that would affect or be caused by the proposed project and the methods proposed to minimize that hazard. The FPP identifies and prioritizes the measures necessary to adequately reduce the fire risks to the project. The FPP also evaluated the consistency of the proposed project with applicable fire protection regulations. The FPP has considered the property location, topography, geology, combustible vegetation (fuel types), climatic conditions, and fire history. It considers water supply, access, structure ignitability, fire resistive building materials for residential structures, technical guidance for protection of commercial structures, fire protection systems and equipment, impacts to existing emergency services, defensible space, and vegetation management.

Prior to any construction for a proposed development at this property, Pulte Group, Inc. must submit a FPP for approval by the Lakeside Fire Protection District and the San Diego County Planning and Development Services Department.

The Brightwater Development will provide 66 residential subdivision lots and 1 open space lot in addition to HOA maintained lots. The development is located on 76.2 acres within the community of Lakeside, County of San Diego, California. This development abuts existing single-family homes to the north and east and a mobile home park to the south. The western boundary is adjacent to the open space lot within the development. Primary access is achieved via Wellington Hill Drive at the approximate midpoint of the project's eastern boundary. Lakeside is an unincorporated community with a population of approximately 20,648.

The Lakeside Fire Protection District (LFPD) encompasses the entire proposed development within its boundaries, and the applicant will work with the LFPD to provide fire service for the project. This FPP must be submitted to the LFPD and the San Diego County Planning and Development Services Department for review and approval.

This plan is consistent with LFPD's local fire code and County guidance and referenced material in the 2011 Consolidated Fire Code, Guidelines for Determining Significance, and applicable State of California requirements. All detailed plans shall comply with the requirements of the County Consolidated Fire and Building Codes.

The proposed development is located within the boundaries of the Helix Water District. The water supply will meet the requirements of the San Diego County Consolidated Fire Code and the County of San Diego Fire Code for a residential development. The Lakeside Sanitation District will provide sewer service.

This FPP provides fuel modification requirements to mitigate the exposure of people or structures to a significant risk of loss, injury or death from wildland fires. Fuel modification will be achieved by removing, clearing, or modifying combustible vegetation and other flammable materials for 100 feet from the edge of all structures.

Ignition-resistant construction for all structures will provide significant protection in this very high fire hazard zone. Ignition-resistant construction requirements provide critical improvements to structures for them to survive a worst-case scenario fire. Another significant requirement will be that the maintenance and repair of the proposed structures will be with the same ignition-resistant materials and construction features. Also, the FPP requires that ignition-resistant construction would apply to mitigate the ignitability of all future proposed structures and projections (i.e., exterior balconies, carports, decks, patio covers, unenclosed roofs and floors).

Lastly, plant species planted in this project will be those listed in APPENDIX 'A' – San Diego County Approved Plant List for High Fire Hazard Areas. Highly flammable, non-fire resistive vegetation will be removed and not re-planted within the area. Three specific non-fire resistive plants that will not be permitted to grow in the Fuel Management Zones even as specimen plants because of their flammability are:

- California sagebrush, *Artemisia californica;*
- Flat-topped buckwheat, *Eriogonum fasciculatum*; and
- Black sage, *Salvia mellifera*.

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1.0 INTRODUCTION

This Fire Protection Plan (FPP) has been prepared for the proposed Brightwater Development. The purpose of the FPP is to evaluate the level of fire hazard that would affect or be caused by the proposed project and the methods proposed to minimize that hazard. The FPP also evaluated the consistency of the proposed project with applicable fire protection regulations. 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 (including secondary/emergency access where applicable); structural ignitability and ignition resistive building features; fire protection systems and equipment; impacts to existing emergency services; defensible space; and vegetation management. The plan identifies areas for hazardous fuel reduction treatments and recommends the types and methods of such treatment. The plan recommends measures that property owners will take to reduce the probability of ignition of structures throughout the development addressed by the plan.

Prior to any construction within this proposed development, a FPP must be submitted to and approved by the Lakeside Fire Protection District and the County of San Diego Department of Planning and Development Services. The FPP establishes both the short-term and long-term fuel modification actions required to minimize any projected fire hazards and assigns annual maintenance responsibilities for each of the required fuel modification actions.

The FPP provides Fuel Modification Zone treatment direction for developers, architects, builders, Lakeside Fire Protection District and Planning Officials, and the homeowners association to use in making all proposed structures in the development safe from future wildfires. This FPP includes:

- A wildland fire hazard rating assessment and expected fire behavior of off-site and on-site native vegetative fuels;
- A long term perimeter vegetative fuel modification treatment and maintenance plan to minimize any loss to residential structures due to a wildfire burning into the project; and,
- Long-term interior open space fuel modification treatment plan and "*firewise"* landscaping criteria to be deployed around the planned structures.

An initial field visit was conducted on June 16, 2014, to evaluate hazardous fuels, lot layout, access road locations, and topography.

This FPP is based upon LFPD Ordinance 11-01 and the County Fire Authority guidance, which contractually serves and supports the Fire Marshal responsibilities for LFPD. Also consulted for this project was the County of San Diego Consolidated Fire Code, Guidelines for Determining Significance, and applicable State of California requirements.

1.1 Project Location

The Brightwater Project ("Brightwater") is located within an Urban Un-zoned Fire Hazard Severity Zone within the community of Lakeside, County of San Diego, California (See Figure 1 – Vicinity Map). Primary access is achieved via Wellington Hill Drive, off Los Coches Road in Lakeside.

1.2 Project Description

The proposed Brightwater Development Project is surrounded by residential development on the northwest, northeast (except the presently undeveloped open space to the east proposed for development in the near future) and the southerly boundaries. The proposed residential lots along the westerly boundary abuts Lot A, the planned open space lot for the Project.

The proposed 76.2 acre Brightwater Development Project is pursuing a Tentative Map with 66 lots for residential parcels and one open space lot. Grading these 66 lots will provide building pads to allow future residential development. Lot 69 will be the dedicated open space lot proposed to protect steep slopes and biological resources.

1.3 Community Overview

The Lakeside Fire Protection District (LFPD) response area is located within the community of Lakeside in San Diego County, approximately 17 miles northeast of San Diego, California and 3.5 miles northeast of the City of Santee. The Lakeside Fire Protection District in San Diego County is home to over 60,000 residents living in the communities of Lakeside, Eucalyptus Hills, Moreno, Winter Gardens, Lakeview, Johnstown, Blossom Valley, Flinn Springs, Pepper Drive and other areas of unincorporated El Cajon. The service area is primarily suburban residential but also has several core commercial zones, some light industry, and many rural/agricultural properties. The District also has a significant wildland/urban interface. The District provides emergency response to all structural fire, vegetation fire, rescues, medical emergencies and other associated emergencies within the LFPD response area. The LFPD response area is bordered on the west by the Santee Fire Department.

The community is located entirely within the boundaries of the Helix Water District. Sewer service will be provided by the Lakeside Sanitation District.

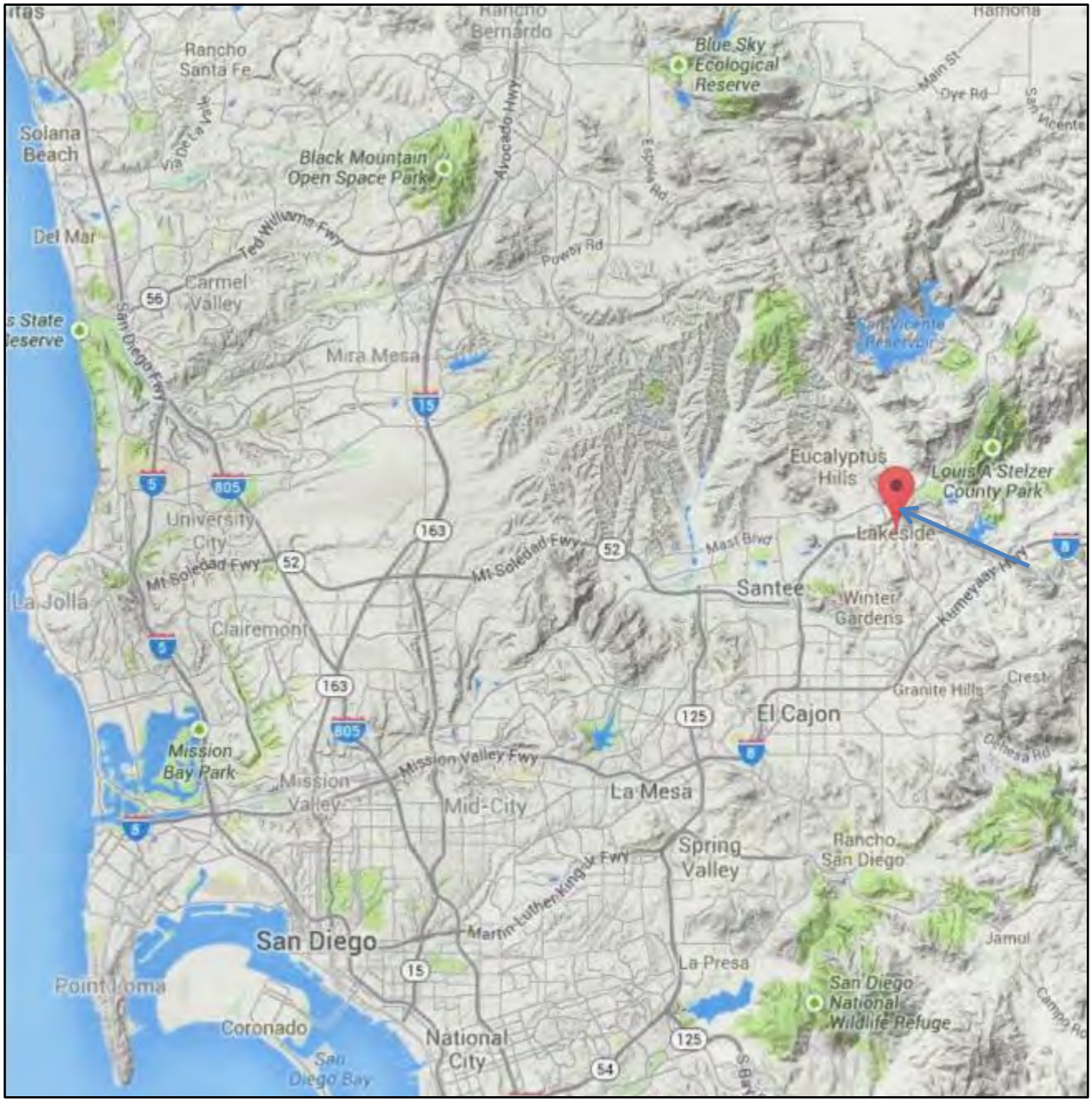

Figure 1 – Vicinity Map (approximate Project location)

1.4 Environmental Setting

The proposed Brightwater Project is located in the vicinity of an urban area. It is an area of highly flammable vegetation. The FPP discusses the surrounding vegetation, climate, fire history, and fire defensibility.

1.4.1 Vegetation

Five vegetation communities/land cover types occur on the Brightwater property according to biology/vegetation information received from Karl Osmundson of HELIX Environmental Planning, Inc. (the project biologist). These include the 1) Diegan coastal sage scrub, 2) non-native grassland, 3) non-native vegetation, 4) disturbed habitat, and 5) developed land. Diegan coastal sage scrub is the major shrub community for the site. Coastal sage scrub communities often contain a substantial herbaceous component. Characteristic plant species within this community on site include California sagebrush (Artemisia californica), California buckwheat (Eriogomum fasciculatum), brown baccharis (Baccharis sarothroides), laurel sumac (Malosma laurina), and white sage (Salvia apiana). The vegetation is currently 2' to 4' in height, is thriving, and will continue to grow vigorously in its natural environment. For purposes of calculating fire behavior parameters, the Fuel Model SCAL18 will be used.

1.4.2 Climate

The County is divided into five climate Zones from the coast to the desert: Maritime, Coastal, Transitional, Interior, and Desert (Climate Zones in San Diego County, *Guidelines for Determining Significance, Wildland Fire, and Fire Protection*). These climate zones are determined by several factors: proximity to the ocean, terrain, elevation, and latitude. Southern California has a Mediterranean climate, characterized by mild, sometimes wet winters and warm, very dry summers. The Mediterranean climate includes all coastal areas, valleys and foothills. Annual precipitation amounts increase gradually from the coast to the mountain crests, then drop dramatically into the deserts. Most precipitation comes from winter storms between November and March. The Brightwater site is located in the transitional climate zone. The Western Regional Climate Center's RAWS station for El Capitan Dam was used to determine climate parameters utilized in the fire behavior modeling process. The mean precipitation for the development site is 15.68 inches per year and the average minimum air temperature for the site for a year is approximately 49.8 degrees, with an average maximum temperature of 80.0 degrees. The average maximum temperatures during the fire season months of July through October is 90.6 degrees. The average mean wind speed on an annual basis is from 4 to 19 mph, while the mean average maximum wind gust is 45 mph. Wind gusts, precipitation and temperature, particularly in a regional context impact wildland fire behavior.

The most critical wind pattern to the project area would be an off-shore wind coming out of the north/northeast, typically referred to as a Santa Ana wind. Such wind conditions are usually associated with strong, hot, dry winds with very low (<15%) relative humidity. Santa Ana winds are caused by high-pressure weather systems 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 typical prevailing summer time wind pattern is out of the south or southwest and normally is of a much lower velocity with occasional gusts up to 30-MPH. It is associated with higher relative humidity readings (> 30% and frequently more than 60%) due to a moist air on-shore flow from the ocean.

All other (northwest, south, west) 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 fire modeling program used in this FPP (BehavePlus 5.0.5) utilizes fuel moisture levels in both live and dead vegetation, projected wind, topography, and vegetation type to determine fire behavior. Wind gusts, precipitation and temperature relative humidity, particularly in a regional context, will significantly impact wildland fire.

1.4.3 Fire History

San Diego County has a history of large, severe wildfires in which people have died and extensive burning of property/structures has occurred. The large fires of 2003 and 2007 are the most recent example of catastrophic wildfires, which have struck San Diego County (See Figure 3 - San Diego County Wildfires of 2003 and 2007).

The wind factor is a key to the spread of wildfires in southern California. Embers from fires driven by high winds (Santa Ana winds) can start fires up to 1.5 miles away from the 'front' of the fire. The maximum distance of '1.5 miles' is the canonical wisdom; it apparently is larger in some cases. A home on Queenston Drive in Escondido burned October 22, 2007 when an ember from 2 miles away landed on its wood shake roof. This is a minimum distance, since the fire never burned closer than two miles to this house (San Diego Union Tribune, November 1, 2007, NI-1). Spot fires spread in the direction of the wind, and in turn can start new spot fires in whatever direction the wind is blowing.

In summary, any wind or topography driven wildfire burning under a northeast (Santa Ana) wind pattern creates a very high wildland fire hazard, especially for wildland fires starting off-site north and northeast of the project. Fire history indicates that the primary threat during this scenario would be flying fire embers. In addition, a typical fire day with a southwest wind will create a high wildland fire hazard.

Fire ecology research has shown that the natural fire regime for the shrub lands and forests in San Diego County is one of frequent small fires and periodic large fires. Figure 2 illustrates the large fires which occurred during the years 2003 and 2007. In addition, over the last 100 years the natural fire process has changed due to fire suppression policies, the introduction of invasive plant species that burn readily (i.e., eucalyptus and palm trees), and building and living within the wildland-urban interface areas.

The Lakeside Fire Protection District responds to approximately 5000 incidents annually including fires, medical emergencies, traffic collisions, rescues, and a wide variety of other requests for service. There is past history of frequent wildfires in similar vegetation and topography found on- and off-site of the proposed Brightwater Project site. However, ***FIREWISE* 2000, Inc.** did not find that any large fires have burned the project area in the last 50 years.

Residential development in the WUI is and will be increasing as the density of structures and the number of residents in the interface increases, the potential ignition sources will multiply and a large wildfire occurrence increases. Efforts in this FPP will be made to mitigate wildfire ignitions within the development from spreading to any surrounding wildland fuels.

Figure 2 - San Diego County Wildfires of 2003 and 2007

1.4.4 Community Fire Defensibility

The Brightwater community will be built to Chapter 7A, ignition resistant building standards for structures in the wildland urban interface. There are two primary concerns for structure ignition: 1) radiant and/or convective heat and, 2) burning embers (NFPA 1144 20081, Ventura County Fire Protection District 20112, IBHS 20083, and others). Burning embers have been a focus of building code updates for at least the last decade, and new structures in the WUI built to these codes have proven to be very ignition resistant. Likewise, radiant and convective heat impacts on structures have been minimized through the Chapter 7A exterior fire ratings for roofs, walls, windows and doors. Additionally, provisions for modified fuel areas separating wildland fuels from structures have reduced the number of fuel-related structure losses. As such, most of the primary components of the layered fire protection system to be provided for the Brightwater Project are required by city and state codes. They are worth listing because they have been proven effective for minimizing structural vulnerability to wildfire. Required interior sprinklers (2010 Building/Fire Code) will activate and extinguish interior fires, should embers succeed in entering a structure. Even though these measures are now required by the latest Building and Fire Codes, until recently they were used as fire hazard reduction measures for buildings in WUI areas because they were known to reduce structure vulnerability to wildfire. These measures performed so well they were adopted into the fire and building codes for the County and State.

In summary, the following project features are required for new development in WUI areas and form the basis of the system of protection necessary to minimize structural ignitions as well as providing adequate access by emergency responders:

- Application of Chapter 7A, ignition resistant building requirements
- Ignition resistant exterior walls and doors
- Class A roof assemblies
- Multi-pane glazing with a minimum of one tempered pane, fire-resistance rating of not less than 20 minutes when tested according to NFPA 257
- Ember resistant vents (recommend Brandguard, Vulcan or similar vents)
- Fire Sprinkler Systems to code for all occupancies
- Modern infrastructure, access roads, and redundant water delivery system

These required measures result in a fire safe community that will be less vulnerable to wildland and structure fires than most of the existing LFPD communities.

2.0 GUIDELINES FOR THE DETERMINATION OF SIGNIFICANCE

The FPP evaluates the level of fire hazard that would affect or be caused by the proposed project and the methods proposed to minimize that hazard. The FPP also evaluates the consistency of the proposed project with applicable fire protection regulations. As part of the assessment, the property location, topography, geology, combustible vegetation (fuel types), climatic conditions, and fire history have been considered. The plan addresses water supply; access (including secondary/emergency access where applicable); solar structural ignitability; protection systems and equipment; impacts to existing emergency services; and, vegetation management.

Factors such as the modification of fuels, fire access, water supply and the use of ignition-resistant construction to protect people and structures from exposure to wildfire events are considered in this FPP. The FPP was prepared in accordance with the County of San Diego Guidelines for Determining Significance and Report Format and Content Requirements for Wildfire and Fire Protection.

2.1 People and Structures' Exposure to Fire

This FPP evaluates the proposed community and its survivability in a worst-case scenario of northeast winds with gusts of 60 MPH (Santa Ana winds) and 'rare event' 30-MPH southwest winds during a wildfire event in the area. It documents fuel modification requirements in combination with the non-combustible construction materials and other fire protections systems for the protection of life and property within this proposed community.

2.2 Adequacy of Fire Service and Access

As stated earlier, the LFPD will provide emergency services to the development. This FPP evaluates and documents the fire code requirements for adequacy of fire service and access. There are no anticipated off-site fire access requirements.

2.3 Water Supply

The Project is located within the boundaries of the Helix Water District. The Lakeside Sanitation District will provide sewer services. This FPP particularly analyzes and ensures that the water supply meets fire emergency water needs, including water sprinkler systems for all facilities on the proposed development.

2.4 Ignition Resistant Construction and Fire Protection Systems

This FPP evaluates ignition-resistant construction related to protecting new structures from an approaching wildfire. These construction standards will provide a high level of protection to structures built in the wildland/urban interface area when done in combination with other fire protections systems within this proposed development.

3.0 WILDLAND FIRE HAZARD AND RISK ASSESSMENT

The proposed Brightwater Development is located on a site that is overall moderately steep in an interior climate zone located approximately twenty (20) air miles inland from the ocean. The east, south and northerly sides of this proposed development are bordered by residential developments, pockets of native and non-native vegetation and Diegan coastal sage scrub. As determined by the State Fire Code, the project area is located in Very High Fire Hazard Severity Zone.

The goal of the FPP is to prevent the loss of lives, structures and personal property when wildfires approach the development from off-site or from potential wildfires ignited within the project site. The challenge is the development of well-planned home sites interspersed with fully functioning coastal sage scrub habitats. This goal is accomplished by requiring 'firewise' communities be built with fire resistant materials and be properly designed, and fuel modification treatments maintained that will safely mitigate the wildfire hazard.

3.1 Vegetative Fuel Assessment

Historic. The off-site and on-site historic vegetation on the majority of the development and perimeter boundaries is characterized as a Fuel Model SCAL 18 – Coastal Sage Scrub (Sage/Buckwheat). The natural fuels on the development site have been significantly altered by recent events and activities, including brush management/hazard abatement work on the development site for wildfire protection for the surrounding communities. However, if all disturbance activities were discontinued, this area would return to a mature SCAL 18 Fuel Model. This scenario would be the greatest concern for the development area during a worst-case scenario northeastern wind pattern (Santa Ana) with very high hot dry winds.

Existing. A survey of the existing vegetation communities/habitats on the 76.2 acre project site was completed by HELIX Environmental Planning, Inc. According to biology/vegetation information from Karl Osmundson with HELIX, 5 vegetation communities occur on site: 1) Diegan coastal sage scrub, 2) non-native grassland, 3) non-native vegetation, 4) disturbed habitat, and 5) developed land. Diegan coastal sage scrub comprises 72.6 acres or over 95 percent of the site.

The coastal sage scrub is characterized by a mixture of drought-deciduous and evergreen shrubs and sub-shrubs. Drought-deciduous elements, such as California sagebrush (*Artemisia californica*), shed or reduce their leaves to minimize water losses during the dry summer months, whereas others such as the California buckwheat (*Eriogonum fasciculatum*), and laurel sumac (*Malosma laurina*), reduce water loss during the drought months with thick, waxy leaves. Other typical woody species of this plant association include white sage (*Salvia apiana*) and black sage (*Salvia mellifera*).

The mature coastal sage scrub on this site is naturally open, but the composition and structure (height and proportion of shrub cover) varies greatly with slope and aspect. In the area of this project, mature stands range between three and five feet in average height and between 50 and 90% shrub cover, with the lowest on southeast-facing slopes. Drier, more exposed slopes of coastal sage scrub also often support stands of the shrub-forming cacti, coastal prickly pear (*Opuntia littoralis*) and coast cholla (*Cylindropuntia prolifera*).

Non-native grasslands occur in 3 locations long the northeast site boundary and consist primarily of red brome (*Bromus madrtitensis*), star thistle (*Centaurea melitensis),* and horehound (*Marrubium vulgare*).

Non-native vegetation is dominated by ornamentals and introduced species. This community occurs in 3 locations along the site perimeter, consisting primarily of stands of non-native trees such as olive (*Olea europaea*), eucalyptus, and the Peruvian pepper (*Schinus molle*).

Disturbed habitat is highly disturbed land and supports non-native, weed, upland species that colonize after human disturbance.

Developed land exists where permanent structures and/or pavement have been placed; e.g., the water tank site and the paved access road leading to the tank.

3.2 Fire Hazard and Risk Assessment

Brightwater is located in a hilly transition climate zone approximately twenty (20) miles inland from the ocean. The planned 68 residential lots abut existing natural vegetation in the planned open space lot along the western boundary. This would particularly affect lots 32-38, 17-31, and 1-6 along the southeastern boundary line. Although lots 1-6 are currently adjacent to undeveloped land, they are located next to a future planned roadway that will serve an abutting residential development known as Jackson Ridge (TM 5423 adopted February 10, 2012) as well as this property. That roadway as well as the adjacent residential development is expected to be built prior to the development of the Brightwater Project.

As is typical of coastal sage scrub vegetation, a high percentage of the plants have an abundance of dead material. This is especially true of the drought impacted black sage and sumac plants. This is due to the effects of our Mediterranean climate where we sometimes have long wet winters that promote lots of new growth and long hot and very dry summer seasons, and occasionally, multi-year droughts which cause significant parts of these plants to die back. All of these plants are adapted to the intense wildfires that they need for species regeneration. However, if wildfire occurs at too frequent intervals the coastal sage scrub plant community reverts to a more flammable, less desirable community of short lived annual grasses with little wildlife value and poor ability to protect the soil.

The coastal sage scrub community has functioned unimpeded in our Mediterranean climate for thousands of years, with both plants and animals thriving and adapting to the wind driven wildfires that burn through the coastal plains every twenty to thirty years. Today our world-renowned climate draws thousands of newcomers to southern California each year and particularly to San Diego County. In the endless search for new home sites, more new homes are being built in the coastal sage scrub plant community where fire will also continue to be a visitor on both a planned and unplanned basis.

The on-site vegetation is in its natural state similar to the surrounding open space. Significant grading will occur during construction which will remove native and non-native species. In a Fuel Management Zone around all structures all vegetation will be modified or removed or selectively thinned. In particular, the flammable native and non-native vegetation will be selectively thinned or removed, including all dead and dying plant material. Cleared areas will be replanted with more fire resistant "*firewise"* landscaping. Within the project boundary, native vegetation will remain in the proposed open space lot, which will balance fuel modifications with natural open space and competing wildlife needs.

3.3 Wildland Fire Behavior Assessment

According to County maps, the Project is in an area called Urban Un-zoned for Fire Hazard Severity (See Figure 3 - Urban Un-zoned Fire Hazard Severity Map). Three scenarios were developed to determine the potential fire behavior of a wildland fire that could occur on or in the vicinity of the proposed Brightwater Project. Fire Behavior calculations were used to support clearance requirements, allowable distances of vegetation treatment and maintenance requirements. The distances and requirements are delineated as Fuel Modification Zones (FMZ). For fire modeling purposes for the overall location of the development, the historic and dominant plant communities are best characterized as coastal sage scrub (SCAL18 FM).

Photo 1 - View of Natural Fuels on the Project Site

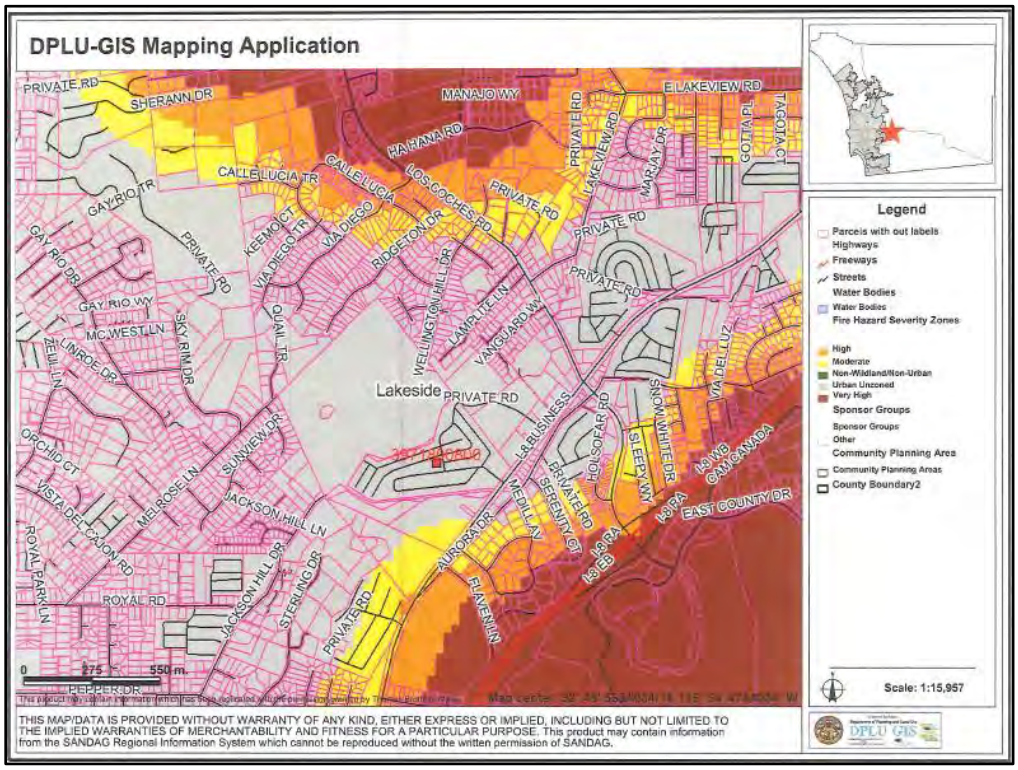

Figure 3- Urban Un-zoned Fire Hazard Severity for Project Area

The BehavePlus 5.0.5 Fire Behavior Prediction and Fuel Modeling System by Patricia L. Andrews and Collin D. Bevins is one of the best systematic methods for predicting wildland fire behavior. The BehavePlus 5.0.5 fire behavior computer modeling system was developed by USDA–Forest Service research scientists 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 was developed by USDA–Forest Service research scientists at the Intermountain Forest Fire Laboratory, Missoula, Montana, and is utilized by wildland fire experts nationwide.

The ***FIREWISE*** **2000, Inc.** evaluation team used the computer based BehavePlus 5.0.5 Fire Behavior Prediction Model to calculate the fire behavior parameters and projections for the historic and existing hazardous vegetative fuels for the proposed Brightwater community. These calculations will be the basis for recommended fuel modifications for the project site development. The existing on-site and off-site fuels will also be considered in evaluating the wildfire threat to this proposed development.

3.4 Fuel Modeling

The primary driving force in fire behavior calculations is the dead fuel, less than one-fourth inch in diameter. These are the fine fuels that carry the fire. Fuels larger than ¼ inch contribute to fire intensity, but not necessarily to fire spread. Fuels larger than three (3") inches in diameter are not included in the calculations (Andrews 1986). The BehavePlus 5.0.5 fire model describes a wildfire spreading through surface fuels, which are the burnable materials within six (6') feet of the ground and contiguous to the ground.

Regardless of the limitations expressed, experienced wildland fire managers can use the BehavePlus 5.0.5 modeling system to project the expected fire intensity (expressed as Btu/ft./sec), rate-of-spread (feet/minute) and flame lengths (feet) with a reasonable degree of certainty for use in fire protection planning purposes. Of the three projected fire parameters, flame length is the most critical in determining structure protection requirements.

The ***FIREWISE*** **2000, Inc.** evaluation team used the computer based BEHAVE Fire Behavior Prediction Model to make fire behavior assessments for the Brightwater Development. The BEHAVE fire model describes a wildfire spreading through surface fuels, which are the burnable materials within six (6') feet of the ground and contiguous to the ground. Since the model was designed to predict the spread of a fire, the fire model describes the fire behavior only within the flaming front. The results of the modeling calculations are summarized in Tables 1, 2, 3, and APPENDIX 'D', which show the results of actual calculations for the fire scenarios.

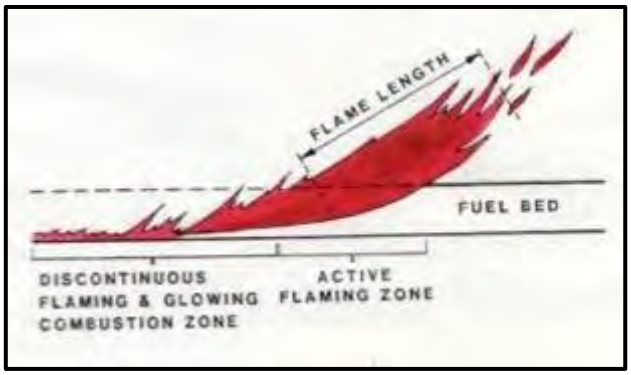

Figure 4 - Description of Flame Length (expressed in Feet)

Photo 2 – Typical Chaparral Fire Behavior Burning under a 10-15 MPH Wind

In order to project the fire behavior benefit for the proposed fuel modifications for the project, worst-case scenarios were used in the modeling system to project fire behavior variables. Two (2) worst case fire scenarios were calculated based on 'worst case' fire weather assumptions for the project area, along with a fire scenario in the late fire season with normal/typical prevailing southwest wind conditions. Each fire scenario displays the expected Rate of Fire Spread (expressed in feet per minute) and Fire Line Intensity (expressed in BTU's/foot/sec, and Flame Length (expressed in feet).

Following are the fire scenarios that will be used to calculate fire behavior parameters in the dominant vegetation type or Fuel Model SCAL18:

- **Fire Scenario #1** – Late fire season with normal/typical prevailing southwest wind conditions
- **Fire Scenario #2** – Late fire season with *30 MPH Above Average Southwest Prevailing Wind Conditions*
- **Fire Scenario #3** – Late fire season with 60 MPH Santa Ana winds

The climate parameters and assumptions used for the fire behavior modeling process follow:

Normal/Typical Scenario Parameters and Assumptions	Worst-Case Scenario Parameters and Assumptions
• 1-Hour Fine Fuel Moisture of .....4% • 10-Hour Fuel Moisture of..... 6% • 100-Hour Fuel Moisture…….....8% • Live Herbaceous Fuel Moisture……..40% • Live Fuel Moisture.....80% • Percent slope……..……...40%	• 1-Hour Fine Fuel Moisture of .....2% • 10-Hour Fuel Moisture of..... 3% • 100-Hour Fuel Moisture…….....5% • Live Herbaceous Fuel Moisture……..30% • Live Fuel Moisture.....50% • Percent slope……..……...40%

The difference between the average and extreme conditions for fire behavior highly depends on wind speed. The normal/typical fire behavior for this area is based on average wind speed of 12 mph), with normal/typical late summer average fuel moisture characteristics. Extreme fire behavior conditions use wind speeds typical of days dominated by Santa Ana wind conditions. In a worst-case scenario, the Rice Fire of 2007 in the northern part of San Diego County recorded wind gusts of 100 mph during a Santa Ana wind event. In the late hot, dry summer during a worst-case Santa Ana wind event, the sustained peak winds average 60 mph. This extreme worst-case wind speed (60 mph) will be used for fire behavior modeling in this FPP. It represents the worst-case fire scenario conditions in 1-, 10- and 100-hour fuels, live herbaceous fuel moisture, and live woody fuel moisture.

Combining the calculated fire behavior predictions and the values at risk information generate current and future "areas of concern," which are useful for prioritizing mitigation actions. Any wind or topography driven wildfire burning under a northeastern (Santa Ana) wind pattern from the north, northeast or east creates a high to a very high wildland fire hazard for the project site. Also, a "rare event" 30 MPH southwest wind will create a moderate wildland fire hazard. This is based on surrounding native fuels in the open space lot and along the perimeter of the project area where there are no existing residential lots that are required to complete annual hazard abatement. With the proposed fuel modification treatments, "*firewise*" landscaping, and the use of ignition resistive building construction standards, these required mitigation measures will significantly reduce the wildfire threat to the structures planned for the Brightwater development. As a result, the potential loss of any structure due to direct flame impingement, wind driven embers, or radiant heat around the perimeter of any planned house is extremely low.

The steepness of slopes representative of the project site will also be key to accurate fire behavior parameter calculations. The steeper locations on the project site will not be developed but would create an overall concern and fire threat to the development. The range of on-site slopes will change when the final grading is completed for the development. The fire behavior model representative slope after the final graded landscape is projected to be 20 percent or less.

The fire behavior modeling with BehavePlus 5.0.5 Fire Behavior Modeling System provided computer based fire behavior parameter calculations. These calculations are key to recommended fuel modification for the development, but they are also based on project site observations, experience, and fuel levels and typical fire behavior observed during local fire seasons. Modification and/or elimination of hazardous fuels and the reduction of fuel loading are key to "*firewise*" planning.

3.5 Fire Behavior Calculations for Hazardous Fuels

Wildland fire behavior parameter calculations have been projected for the hazardous vegetative fuels on the undeveloped areas in proximity to the development boundaries. The fire behavior calculations are also projected after required fuel modifications are implemented. The calculations are based on scenarios that are "worst case" San Diego County fire weather assumptions. They also include input from site observations of on-site and off-site fuels, topography, and fire history. Tables 1, 2, and 3 below summarize the expected Rate of Fire Spread (expressed in feet per minute), Fireline Intensity (expressed in British Thermal Units per foot per second), and flame length (expressed in feet).

Table 1 – Fire Scenario 1

Fire Scenario 1 – Normal/typical 12 MPH Winds Along Southwest Exposures, UNTREATED: FM SCAL18 - Coastal Sage Scrub; TREATED: FM-sh1 – Low Load, Dry Climate Shrub (With Less Than One-Half Native Shrubs Retained)		
Prior to Fuel Treatment	**VS.**	**After Fuel Treatment**
Rate of Spread: 81.1 ft/min		**Rate of Spread: 25.8 ft/min**
Fireline Intensity: 5892 BTU/ft./sec		**Fireline Intensity: 184 BTU/ft./sec**
Flame Length: 24.4 Feet		**Flame Length: 5.0 Feet**

Table 2 – Fire Scenario 2

Fire Scenario 2 - 30 MPH Above Average Prevailing Wind Conditions Along Southwest and West Exposures; UNTREATED: FM SCAL18 - Coastal Sage Scrub: TREATED: FM-sh1 – Low Load, Dry Climate Shrub (With Less Than One-Half Native Shrubs Retained)		
Prior to Fuel Treatment	**VS.**	**After Fuel Treatment**
Rate of Spread: 166.9 ft/min		**Rate of Spread: 76.3 ft/min**
Fireline Intensity: 12125 BTU/ft./sec		**Fireline Intensity: 545 BTU/ft./sec**
Flame Length: 34 Feet		**Flame Length: 8.2 Feet**

Table 3 – Fire Scenario 3

Fire Scenario 3 - 60 MPH Northeast Winds (Santa Ana Winds) Along North and Northeast Exposures, UNTREATED: FM SCAL18 - Coastal Sage Scrub; TREATED: FM-sh1 – Low Load, Dry Climate Shrub (With Less Than One-Half Native Shrubs Retained)		
Prior to Fuel Treatment	**VS.**	**After Fuel Treatment**
Rate of Spread: 301.7 ft/min		**Rate of Spread: 134.9 ft/min**
Fireline Intensity: 21917 BTU/ft./sec		**Fireline Intensity: 964 BTU/ft./sec**
Flame Length: 44.7 Feet		**Flame Length: 10.6 Feet**

Table 1 reflects the change in the fire rate of spread, fire line intensity, and flame length prior to fuel treatment and following the required fuel modification work in a normal/typical late summer wind condition. Table 2 shows the change in fire behavior parameters prior to and following required fuel

treatment in a late summer above average prevailing wind condition. Table 3 reflects the change prior to and after required fuel treatment in a fire scenario of 60 MPH northeast winds (Santa Ana). This reduction of native shrubs will result in native and non-native grasses that could occupy the open space created by fuel modification. The removal of these native and non-native fuels around and under native shrubs will eliminate vertical fuel ladders. Additional reduction in rate of spread, fireline intensity, and flame length occurs when native and non-native grasses are reduced to a 4-inch stubble, typically completed in May or June of each year.

4.0 MITIGATION MEASURES AND DESIGN CONSIDERATIONS

This Fire Protection Plan will recommend mitigation measures and design considerations based on the sequencing and approval of construction. The timing of construction will be determined at a later time but will be required to comply with the mitigation measures contained in this FPP.

4.1 Adequate Emergency Services

As stated earlier, the Lakeside Fire Protection District provides emergency response to all structural fire, vegetation fire, rescues, medical emergencies and other associated emergencies within the LFPD response area. The LFPD response area is comprised of 55 square miles. The LFPD has primary responsibility to minimize loss of life, property, personal injury and environmental damage from fire, accident, medical, and hazard related emergencies. The Operations Division personnel operate out of four fire stations staffing four paramedic engine companies, one rescue company, two brush engines, and two advanced life support paramedic ambulances. Lakeside firefighters respond to over 5000 incidents annually including fires, medical emergencies, traffic collisions, rescues, and a wide variety of other requests for service.

Following are the four geographically located fire stations positioned throughout the District and from which emergency services are provided:

Fire Station #1 is located at 9726 Riverview Ave. Fire Station 1 houses a paramedic engine company and brush engine. This station provides first response to the Winter Gardens, El Nopal, and Lakeside areas of the fire district and also provides automatic-aid response to the City of Santee.

Fire Station #2 is located at 12216 Lakeside Avenue. Fire Station 2 serves the northern areas of the fire district including Eucalyptus Hills, Moreno, Wildcat Canyon and Highway 67. This station houses a paramedic engine company, water tender, and an advanced life support paramedic ambulance. Station 2 provides automatic-aid response to the Barona Fire District and unincorporated San Diego County.

Fire Station #3 is located at 14008 Highway 8 Business. Fire Station 3 serves the southwestern area of the fire district and also provides automatic-aid response to the City of El Cajon, Alpine, and Viejas Fire Districts. Station 3 houses several units including a paramedic engine company, rescue company, and an advanced life support paramedic ambulance.

Fire Station #26 is located at 15245 Oak Creek Road. Fire Station 26 serves the eastern section of the fire district including Blossom Valley, Flinn Springs and the Dunbar Lane area and houses one paramedic engine company. This station houses a paramedic engine company and brush engine. Station 26 provides automatic-aid response to the Alpine and Viejas fire districts.

Emergency Response Requirement and Initial Emergency Travel Times for LFPD. The emergency response objective is identified in the Public Facilities Element of the County General Plan. Brightwater must demonstrate that fire services can be provided that meet the minimum travel time identified in the Public Facilities Element. Travel time is defined as the estimated time it will take for the nearest station to reach the furthest structure in a proposed development project. Travel time is determined by measuring the most direct reliable route with consideration given to safe operating speeds for heavy fire apparatus. Travel time does not include reflex or reaction time, or on-scene size-up and set-up prior to attacking the fire, all of which are critical precursors of actual firefighting. The emergency travel times for fire stations in the immediate area are based on NFPA 1142, Standard on Water Supplies for Suburban and Rural Fire Fighting; Table C.11 (b).

Figure 5 – Location of Lakeside Fire Protection District Fire Stations

The required provision of fire protection services for all calls is to attain the following travel time goals (or provide a level of fire protection functionally equivalent to that provided by such response times):

- The Public Facilities Element of the County General Plan requires that total travel time for deployment and arrival of the first-in engine company for a fire suppression incident should be within 5 minutes. Add one minute for turnout time and one minute for dispatch time.

- Total travel time for deployment and arrival of the full first alarm assignment for a fire incident should be within 8 minutes. Add one minute for turnout time and one minute for dispatch time.

The Brightwater Development is within the response area of the Lakeside Fire Protection District. The closest Fire Station identified by LFPD to provide primary emergency fire services for the

Brightwater Development is Station #3 located at 14008 Highway 8 Business, Lakeside, CA, approximately 2.4 miles away. The travel time from this station to the furthest structure would be approximately 5.0 minutes. This fire station is fully staffed 24 hours a day, seven days a week.

This travel time is based on an average safe speed of 35 mph and would meet the County General Plan policy for maximum travel time. If the travel time is based on posted speeds of the roadway, the calculated travel time would be significantly reduced. Strobe sensors on the major intersection street/traffic lights will also decrease the travel time by reducing the acceleration/deceleration constant for emergency apparatus. The approximate travel time would be reduced by approximately 1-1/4 minutes when travel is based on posted speeds and installation of strobe sensors. As stated above, travel time is calculated based on NFPA 1142, using the formula T= 0.65 + XD, where T=time (min) of average one-way trip travel, X=average speed factor (60/average speed), and D=one-way distance.

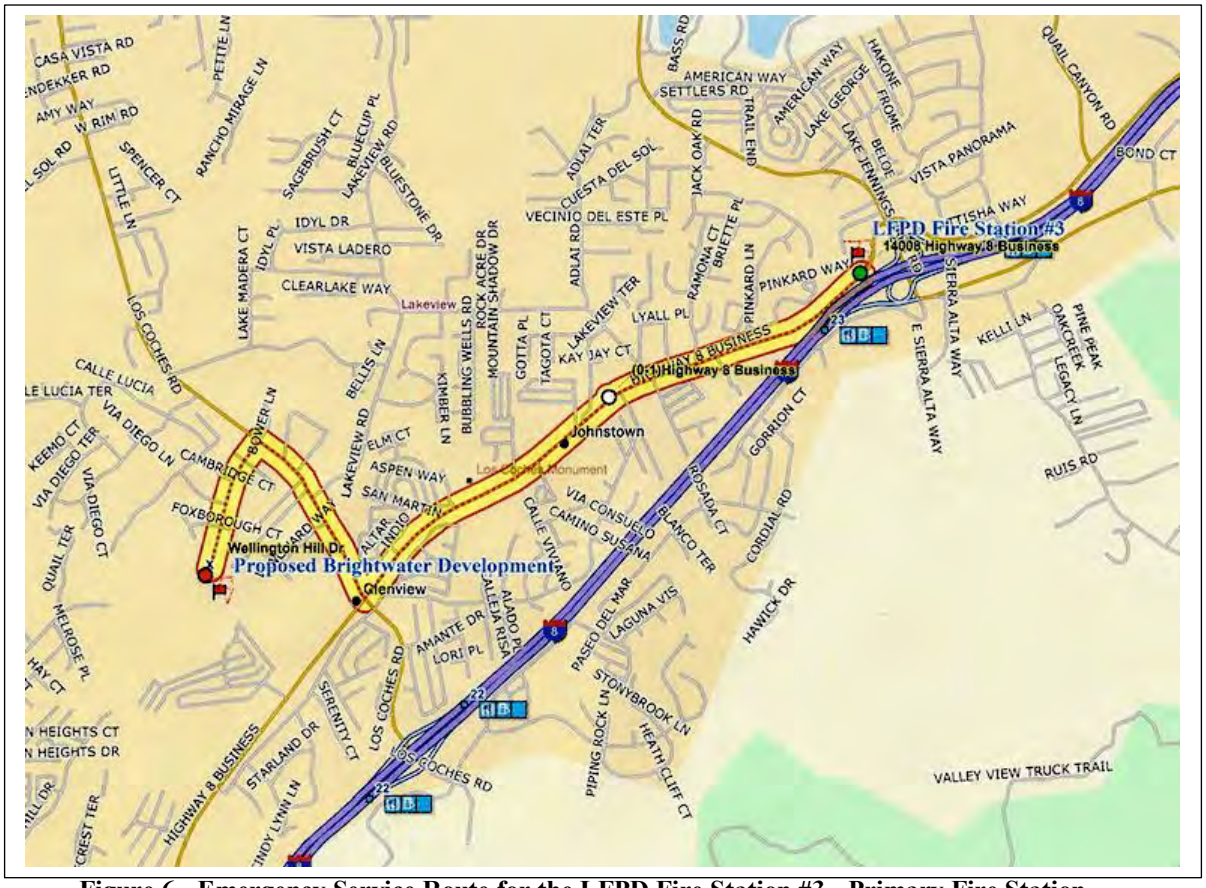

Figure 6 - Emergency Service Route for the LFPD Fire Station #3 - Primary Fire Station

In addition, LFPD Station #1 is approximately 2.9 miles away, approximately 6 minutes travel time from the development, and could significantly assist and support an emergency incident on or around the proposed Brightwater Development. The LFPD has also established several auto and mutual aid agreements with surrounding fire departments. However, on high/extreme fire danger days there are often multiple starts and engine companies are often already deployed on other incidents. This is why **Firewise Communities©** use ***"Survivable Space"*** strategies that enable and enhance communities to survive a wildfire on their own and without the loss of any structures or lives and without the intervention of the Fire Department. ***"Survivable Space"*** includes the area that lies between the

residence and an oncoming wildfire, where the vegetation has been greatly modified, primarily the irrigated green lawn around each structure.

The analysis of this FPP recommends that based on the location of LFPD Fire Station #3, the proximity of Fire Station #1, and established mutual and automatic aid agreements with surrounding fire departments, the emergency services for this Project can be met. This recommendation is also based on required ignition-resistant construction, a required 100-foot fuel modification zone, fire water supply, and enhanced fire access for emergency apparatus described herein.

4.2 Fire Apparatus Access

The project proposes the extension of Wellington Hill Drive from its current terminus southwesterly off of Los Coches Road for access to lots 1 thru 31 and 56 thru 67. The Project will construct one internal roadway (Wellington Hill Court) to access lots 32 through 55. In order to minimize impediments to fire apparatus access, the roadway circulation network shall be designed according to the County public road standards and in compliance with CFC Sec. 503.2.1.

The following specific requirements are outlined, but not all inclusive, for fire apparatus access per LFPD and the County Consolidated Fire Code:

4.2.1 The proposed development design exceeds the maximum length 800 feet for a dead-end road, including all dead-end roads accessed from a dead-end road. To mitigate this, the FPP will require 56 feet of right-of-way and a roadway 36 feet wide curb to curb, which will be maintained at all times. When serving one home the access will be a minimum of 16 feet. Additionally, these fire apparatus access roads will not be obstructed in any manner, including these interior roadways, which will be designated 'fire access roadways' or 'fire lanes'.

4.2.2 Emergency vehicle turnarounds shall be provided on 'fire lanes' exceeding 100 feet in length. In this development, turnarounds and turning radius for emergency vehicles must be reviewed and approved by the LFPD and the County's Engineering Department.

4.2.3 Fire apparatus access road shall extend within 100 feet of all portions of a structure and all portions of the exterior walls of the first story of a residence as measured by a route around the exterior of every residence in the development.

4.2.4 All roads shall be provided with an approved driving surface for each phase of development. The first layment of asphalt must be in place and serviceable prior to delivery of combustible construction materials to the site.

4.2.5 Gates proposed for this development shall be in compliance with LFPD guidelines and County Consolidated Fire Code, Section 503.6. An automatic gate across a fire apparatus/equipment access roadway or driveway shall be equipped with a Knox rapid entry system and emergency vehicle strobe detector. Any gate or barrier across a fire apparatus access roadway shall have specific plans reviewed and approved by LFPD prior to installation.

4.2.6 The road and street grade standard for fire apparatus shall not exceed 20 percent, and any roadway over 15 percent shall be a concrete surface with a deep broom finish perpendicular to the direction of travel to enhance traction.

4.2.7 Fire apparatus access roads shall be designed and maintained to support the imposed loads of fire apparatus of not less than 75,000 pounds and will be provided with an approved paved surface so as to provide all-weather driving capabilities.

4.2.8 **Secondary Access and Dead End Roadways.** The development in combination with designated and marked 'fire lanes' will provide adequate access for fire apparatus and other emergency equipment. There will be one primary ingress and egress point from Wellington Hill Drive to Los Coches Road. The future Jackson Ridge Parkway (to be constructed by an adjacent residential development) will provide additional access from the project site to Highway 80.

4.2.9 Access points to the open space lot shall be provided and identified for access by fire and emergency service personnel and apparatus, e.g., the cul-de-sac at the end point of Wellington Hill Court.

4.2.10 Any roadway design features proposed (speed bumps, speed humps, speed control dips, etc.) which may interfere with emergency apparatus responses shall not be installed on fire access roadways, unless they meet design criteria approved by LFPD.

4.3 Water Supply

The water supply for the proposed Brightwater Development will be provided by the Helix Water District. Sewer service will be provided by the Lakeside Sanitation District. Water supply will meet the water supply requirements of the San Diego County's Consolidated Fire Code and the Lakeside Fire Code for a residential development. Following are specific requirements.

4.3.1 All buildings shall be fully protected with automatic fire sprinkler systems. The installation of the sprinkler systems shall meet NFPA 13D Standards. The 2012 California Building Standards Code, requires automatic fire sprinkler systems for all new one- and two-family dwellings and townhouse construction statewide.

4.3.2 All fire hydrants shall be installed and serviceable by all acceptable code standards prior to delivery of combustible construction materials to the site.

4.3.3 For this development of single-family dwellings, fire hydrants spacing shall be a minimum of 300 feet with all locations approved by the Lakeside Fire Protection District.

4.3.4 Fire hydrants shall be located along 'fire lanes' and all structures and other improvements shall be reached with a maximum hose pull of 100 feet, or as approved by the LFPD.

4.3.5 An approved fire hydrant/water supply system shall be capable of supplying a minimum of 2,500 gallons per minute at a residual pressure of 20 psi. Waterlines for fire control must be

capable of supplying this required demand through the hydrants, plus the largest fire sprinkler demand, plus any domestic use supplied from that line.

4.3.6 When an on-site waterline serves more than two hydrants, the line must be looped, providing two hydraulically remote points of connection with the water district lines. The interior loop must have isolation valving such that not more than two hydrants and/or sprinkler systems are between isolation points. If the on-site fire water system for a structure is a private loop, the two points of connection are needed to the public supply and appropriate fire department connections.

4.3.7 Each hydrant for this development shall be Jones hydrants and have one 4-inch and one 2-1/2-inch outlets. In some instances LFPD may require a fire hydrant to have other combinations of 4 inch and 2½ inch outlets. All fire hydrants will be of bronze construction, including all internal parts except seats.

4.3.8 The LFPD approval shall be required for on-site hydrant and fire service waterline based on the final building construction location, type and largest building size.

4.3.9 All hydrants shall be located along access roadways and shall not be closer than 50 feet from structures.

4.3.10 Fire hydrants shall be located with blue reflective raised pavement markers at approved locations for each hydrant.

4.4 Fuel Modification Zones and Required Treatments

Fuel modification is typically within a Fuel Management Zone (FMZ) of 100 feet. Within the FMZ, there shall be an irrigated zone of 50 feet from the edge of all structures. In this zone, all vegetation would be removed and re-planted with fire resistant landscaping. Zone 1 may fall outside of residential lots 37 and 38. This would be defined as Zone 1, and identified as a separate lot.

In the area 50 to 100 feet from the edge of Zone 1, native- and non-native vegetation which exists within this zone will be removed, so that combustible vegetation does not occupy this zone. This would be a non-irrigated zone defined as Zone 2 and identified as a separate HOA lot.

The Biological Report prepared by Helix Environmental Planning, dated July 16, 2014, requires a Limited Building Zones (LBZ) onsite next to the open space lot, to provide 100 feet of defensible space to structures to the south and west of the project. This LBZ spans the 100-foot Fuel Management Zone, from the edge of each structure to the edge of the open space lot.

The County Consolidated Fire Code does state that the standard for the FMZ is irrigated 50-foot Zone 1 and a non-irrigated 50-foot Zone 2. As native and non-native combustible vegetation cover in Zone 2 is removed, there is a very high probability that this Zone 2 will be dominated with non-native weeds or grass species. With this in mind, all grasses and weeds will be mowed or weed-whipped to a 4-inch stubble height by June 1st of each year or when the fuels become cured, whichever occurs first. It is the recommendation of this FPP, then, that a 50-foot Zone 1 and a 50-foot Zone 2 would be adequate for this site and this proposed development. (See EXHIBIT 1 - Fuel Treatment Location Map)

Brightwater abuts residential properties along all boundaries, except the boundary adjacent to the open space lot. The proximity of these residential properties provides enhanced hazard abatement support and protection for residential structures along Brightwater boundaries in these perimeter areas. The hazard abatement support by adjacent residential developments and the 100-foot FMZ along the open space lot will provide protection of residential structures in the proposed Brightwater development.

The exceptions for clearing or modifying flammable vegetation or other highly combustible fuels in the FMZ follow:

- Single specimens of trees or other vegetation that are well pruned and maintained
- Non-irrigated grass and other vegetation located more than 50 feet from the structure and less than 18 inches in height above the ground
- All ornamental landscaping that is consistent with San Diego County acceptable plants for a defensible space in fire prone areas plant list (See APPENDIX 'A')

The interior roadway rights-of-way within Brightwater will be irrigated and landscaped, and thereby will meet and be compliant with roadway fuel modification requirements.

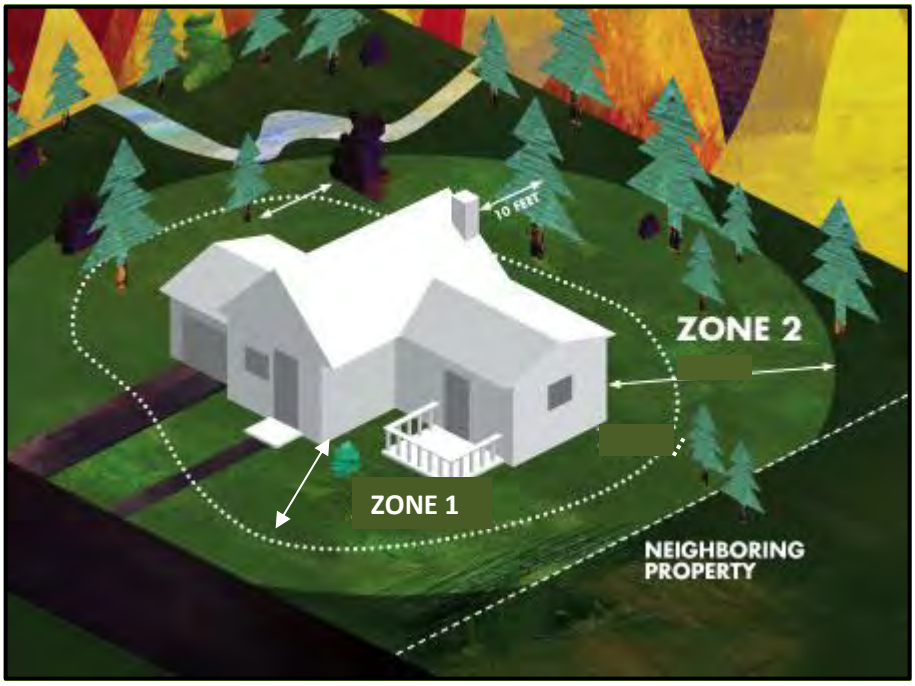

Figure 7 - Example Fuel Modification Around Residential Structure

Maintenance of fuel treatment zones is highly important. Latham (1989) found that ember ignitions were primarily a function of ground fuels, including litter depth. Also imporant to ignition of a ground fuel is moisture content, size of the litter material as well as the mineral content of the dead vegetation. To the benefit of the eventual homeowners, ground fires burn with less intensity than an aerial fuel. However, a ground fire may carry to adjacent aerial fuels which is a concern.

4.4.1 <u>Fuel Modification Zone 1 – Irrigated</u>. For Brightwater, it is proposed that Zone 1 be a minimum of 50 feet from the edge of each residence. Roads, "non-structure" improvements,

manufactured slopes are allowed and can be used to meet the criteria for this zone. The following specific requirements are outlined, but not all inclusive, for Zone 1.

4.4.1.1 This zone shall be irrigated (micro-irrigation acceptable when overhead irrigation may cause erosion). It includes manufactured slopes within this zone. Landscaping material from the approved plant list (See APPENDIX 'A') required or in a landscape plan approved by the Fire Marshal.

4.4.1.2 All undesirable non-native vegetation (See APPENDIX 'B') shall be removed. Also, no plants on the California Exotic Pest Plant Council's list of "Exotic Pest Plants of Greatest Ecological Concern in California as of October 1999" or more recent version shall be planted.

4.4.1.3 Vegetation may include single or cluster (no more than two to three plants/trees) of trimmed fire resistant native and ornamental plants.

4.4.1.4 Dense plant masses adjacent to the structures and at bases of trees and tree clusters shall not be placed in this zone. Vegetation must be low growing, fire resistive, deep rooted, drought tolerant plantings to maintain erosion control and soil stability, especially on manufactured slopes.

4.4.1.5 Native or ornamental trees can be retained within this fuel modification zone. They shall be pruned to maintain a vertical separation of approximately 10 feet above underlying shrubs or groundcover. Pruning of the shrubs will minimize the impact of the tree pruning.

4.4.1.6 Trees may be planted and/or maintained as individual specimens, or clustered. Groups should be two to three trees maximum, with mature foliage of any group separated horizontally by at least 10 feet if planted on less than 20 percent slope, and 20 feet if planted on greater than 20 percent slope.

4.4.1.7 Tree canopies shall not be allowed to overhang the roof of any structure; the outer edge of the canopies of mature trees will be a minimum of 10 feet from the building eaves, and free of all dead or dying parts. All the dead material must be pruned out of all vegetation on a regular basis. Trees and vegetation should not be planted in areas where fire truck access is impaired, and should not impair or obstruct the use of fire department ladders.

4.4.1.8 Mulches, chips and other small multi-cuttings (cut to less than two inches in diameter and four inches in length) shall be evenly spread over the area no more than 4 inches, at least 50 feet from structures. This can be used to maintain soil moisture and prevent grass and weed encroachments within the treated areas. Regular maintenance, vegetation pruning, and irrigation to establish drought tolerant, fire-resistive landscaping are very important in this Zone.

4.4.1.9 Construction materials, firewood, and other combustible materials shall not be stored in unenclosed spaces beneath buildings or structures, or on decks or under eaves, canopies or other projections or overhangs. Storage may occur in the defensible space located a minimum of 30 feet from structures and separated from the crown of trees by a minimum of 10 feet, measured horizontally.

4.4.1.10 Ornamental plants will not be planted or allowed to become established within this Zone, unless shown in the Recommended Plant Lists in APPENDIX 'A' (or in an approved landscape plan approved by the Fire Marshal).

4.4.1.11 Plants in this zone will not include any pyrophytes that are high in oils and resins (particularly) undesirable plant species listed in APPENDIX 'B').

4.4.1.12 Ornamental plants will not be planted or allowed to become established within this zone, unless non fire-resistive trees, including conifers, pepper trees, eucalyptus and acacia species, shall be planted and maintained so that the trees drip line at maturity is a minimum of 30 feet from any combustible structure.

4.4.1.13 Non-flammable patios, walkways, rock, driveways and gravel can be used to break up fuel continuity within this zone.

4.4.1.14 If shrubs are located underneath a tree's drip line, the lowest branch will be at least three times as high as the understory shrubs or 10 feet, whichever is greater.

4.4.1.15 Trees may be planted and/or maintained as individual specimens, or clustered with 2 to 3 trees in a single cluster; crowns of mature trees shall maintain a minimum horizontal clearance of 10 feet for fire resistant trees and 30 feet for non-fire resistive trees; and avoid planting trees directly uphill or one another. The following table 4907.3.1 from the County Consolidated Fire Code defines the distance between mature tree canopies by percent slope.

TABLE 4907.3.1
DISTANCE BETWEEN TREE CANOPIES

Distance between Tree Canopies by Percent Slope	
Percent of Slope	**Required Distances Between Edge of Mature Tree Canopies (1)**
0 to 20	10 feet
21 to 40	20 feet
41 plus	30 feet

4.4.1.16 The area on each side of the improved width of highways, private roads, and driveways shall comply with the requirements of this fuel modification zone.

4.4.2 Zone 2 Fuel Modification – Non-Irrigated

For Brightwater, Zone 2 is typically the area 50-100 feet beyond Zone 1. Again, roads and other "non-structure" and non-combustible improvements are allowed in this zone.

In this Zone, the fuels and vegetation will be cleared and modified as described below.

4.4.2.1 In Zone 2, the fuel volume will be removed, or thinned by 50 percent, including the removal of all highly flammable, undesirable species, and dead and dying vegetation.

4.4.2.2 Irrigation will be used only if needed to establish and maintain fire-resistive landscaping.

4.4.2.3 There is a very high probability that the removal of all vegetation/fuels will result in the establishment of non-native weed or grass species. All grasses and weeds shall be mowed or weed-whipped to a 4-inch stubble height by June 1st of each year or when the fuels become cured, whichever occurs first.

4.4.2.4 Any vegetative biomass (debris and trimmings) produced by thinning and removal of vegetative materials shall be removed from the site or converted to mulch by chipping and evenly distributed to a maximum depth of four (4) inches a minimum of 30 feet from the edge of structures. This mulching concept helps to maintain soil moisture for the designated plants, reduces the growth of annual grass and minimizes soil erosion.

4.4.2.6 The following native species will not be permitted to grow in this zone even as specimen plants because of their flammability:

- California sagebrush, *Artemisia californica;*
- Flat-topped buckwheat, *Eriogonum fasciculatum*; and
- Black sage, *Salvia mellifera*.

4.4.3 Fuel Maintenance

Maintenance within the zones shall be performed year-round and include the following:

4.4.3.1 Prune and thin trees around structures to decrease fuel volume, retain succulent growth and provide adequate clearance between structures and plants, as required in the County Consolidated Fire Code.

4.4.3.2 Tree branches overhanging roofs shall be removed.

4.4.3.3 Trash and combustible debris shall be cleared from around structures, and removed from roofs and rain gutters.

4.4.3.4 Irrigation systems will be maintained to ensure that they function properly and plantings are watered sufficiently to maintain succulent growth.

4.4.3.5 The responsibility for the fuel modification maintenance shall remain with each lot owner and any subsequent owners, and a Home Owners Association (HOA) for the common areas. In the event a lot is repossessed or sold, the unit or agency holding title to the lot will be responsible for maintenance.

4.5 Ignition Resistant Construction and Fire Protection

Ignition-resistant construction for all structures will provide significant protection in this very high fire hazard zone. Ignition-resistant construction requirements will provide critical improvements to all types of structures for them to survive a worst-case scenario fire storm in this area. Another significant requirement will be that the maintenance and repair of these proposed structures will be with the same ignition-resistant materials and construction features. Also, this FPP requires that ignition-resistant construction will apply to mitigate the ignitability of all future proposed residential

structures and projections (exterior balconies, carports, decks, patio covers, unenclosed roofs and floors).

All structures within a wildland-urban interface as defined in the County Building Code must be built using ignition-resistive construction methods (Building Code (Title 9, Division 2, Chapter 1 of the San Diego County Code of Regulatory Ordinances). Construction requirements must meet all then-current County and State of California Building Codes (Chapter 7A) requirements for construction in wildland areas. Enhanced construction design requirements found in the County Building Code (more restrictive than the California Building Code) will significantly reduce the threat of wildfire for this development, especially the flying embers entering a structure, landing on a receptive fuel and starting a new fire.

Following are specific fire-resistive building features that shall be applied to all structure construction that will be implemented at the site plan or building permit stage:

4.5.1 All stuctures within the Brightwater Project shall be built with a Class A roof assembly, including a Class A roof covering (per CBC Chapter 7A). It should be noted that recent testing has found that solar panels mounted within about 5 inches of a Class A roof assembly may nullify the Class A rating of the assembly.

4.5.2 All exterior walls on all sides of the buildings shall be constructed with one-hour fire resistant building materials, and protected with two-inch nominal solid blocking between rafters at all roof overhangs and under the exterior wall covering. Wood siding of 3/8 inch plywood or ¾ inch drop siding is permitted, but must have an underlayment of ½ inch fire-rated gypsum sheathing that is tightly butted or taped and mudded, or other ignition-resistive materials approved by the Fire Authority Having Jurisdiction (FAHJ) and/or the Planning Authority Having Jurisdiction (PAHJ).

4.5.3 All vents (roof, foundation, combustion-air, etc.) shall resist the intrusion of flames and embers or shall be protected by louvers and 1/8" non-combustible, corrosion-resistant mesh. Turbine attic vents shall be equipped to allow rotation in only one direction (County Building Code 704A.2.1). Attic ventilation openings or ventilation louvers will not be permitted in soffits, in eave overhangs, between rafters at eaves, or in other similar exterior overhanging areas in this wildland/urban interface area. Attic ventilation shall also comply with the requirements of the California Fire Code. (It is recommended that vents produced by Vulcan or Brandguard or any simiular vents be used in wildland/urban interface areas).

4.5.4 All eaves of roof overhangs shall be enclosed (boxed eaves) on all sides with non combustible materials or constructed with heavy timber such as 2x starter board and 3x6 rafter tails.

4.5.5 Structure openings: Louvers, ventilators, or openings in walls, roofs, attics, and underfloor areas having headroom less than four (4) feet in height which are not fitted with sash or doors shall be covered with wire screen. The screen covering of such openings will be of corrosion-resistant metal or other approved material that offers equivalent protection, and will have a maximum mesh of one-eighth (1/8) inch.

4.5.6 All projections (exterior balconies, stairs, covers, unenclosed roofs and floors, and similar architectural appendages and projections) shall be of non-combustible construction, one hour ignition resistive construction on the underside, or heavy timber construction. When such

appendages and projections are attached to exterior fire-resistive walls, they shall be constructed to maintain the fire-resistive integrity of the wall.

4.5.7 All glass or other transparent, translucent or opaque glazing materials, including skylights, shall be constructed of tempered glass or a dual glazed windows with minimally one pane of tempered glass.

4.5.8 Fences and other structures less than 5 feet from a building shall be non-combustible construction, heavy timber or fire retardant pressure treated wood.

4.5.9 All rain gutters, down spouts and gutter hardware shall be constructed from metal or other noncombustible material to prevent wildfire ignition along eave assemblies.

4.5.10 Gutters shall be designed to reduce the accumulation of leaf litter and debris that contribute to roof edge ignition.

4.5.11 Exterior door assemblies will conform to the performance requirements of standard SFM 12-7A-1 or will be of approved non-combustible construction, or solid core wood having stiles and rails not less than 1 3/8 inches thick with interior field panel thickness no less than 1 1/4 inches thick, or will have a fire-resistance rating of not less than 20 minutes when tested according to ASTME 2074.

4.5.12 All windows to be screened shall be provided with mesh metal or similar non-combustible window screens to prevent embers from entering the structure during high wind condition.

4.5.13 Any damaged or replacement window, siding, roof coverings, and specific non-combustible wall shall meet or exceed the original intent of the fire protection discussed in this Plan.

4.5.14 Buildings and structures will be set back a minimum of 30 feet from property lines and open space easements unless the County Zoning Ordinance requires a greater minimum. When the property line abuts a roadway the setback will be measured from the centerline of the roadway.

4.5.15 Fire protection tactical operations for proposed two-story residential structures will be based on structures less than 35 feet in height.

4.6 Cumulative Impact Analysis

The combination of San Diego County's weather, fuel, and terrain has often contributed to intense, uncontrolled wildland fires. This was clearly evident in the recent fire sieges of 2003 and 2007.

Fire hazards and risks to all types of development will continue to be encountered as they have over the last century. The proposed development of residential pads in this project site is adjacent to Lot 69, the open space lot, on the westerly edge of the residential lots, which has the potential to support wildland fires. At present, the density of development in this portion of San Diego County is relatively low and the local fire protection district has the capacity to provide adequate fire protection. If the recommendations in this plan are implemented, this development will not expose people or habitable structures to a significant risk of loss, injury or death. Following the recommendations would also decrease the risk of loss for surrounding existing uses. As proposed, the project is not anticipated to contribute to a significant cumulative impact relative to wildland fire risk.

4.7 Additional Requirements

4.7.1 The grading plan must be submitted and approved by the Lakeside Fire Protection District.

4.7.2 Single story structures shall be setback a minimum 15 feet horizontally from top of a slope to the farthest projection from a roof. A single story structure shall not be more 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.

4.7.3 Brush and other flammable vegetation will be removed prior to commencing any construction activity. During construction at least 50 feet of clearance around the structures will be kept free of all flammable vegetation as an interim fuel modification zone during construction of structures.

4.7.4 Any disputes over fuel modification of individual lots or common areas and interpretation of this Fire Protection Plan (FPP) shall be decided by Fire Chief and Fire Marshal. The Fire Marshal's decision shall be final and binding for the development.

4.7.5 A lighted directory of the development noting building numbers, solar panel designations, etc. shall be installed near the entrance with approval from the LFPD.

4.8 Fuel Treatment Location Map

A Fuel Treatment Location Map shows the location of all proposed fuel modification treatment locations and other mitigation measures for the known locations of structures within the development. For this FPP, Exhibit 1 illustrates the recommended fuel modification treatment locations required for the Brightwater Development.

5.0 CONCLUSIONS

This FPP evaluates the adverse environmental effects that the proposed Brightwater Development may have from wildland fire and to properly mitigate those impacts to ensure that this development does not unnecessarily expose people or structures to a significant risk of loss, injury or death involving wildland fires.

5.1 Emergency Response

The analysis of this FPP documents that given the location of LFPD Fire Station #3, the proximity of Fire Station #1, and established mutual and automatic aid agreements with surrounding fire departments, the FPP supports that the emergency services for this project can be met. This recommendation is also based on required ignition-resistant construction, a required 100-foot fuel modification zone, fire water supply, and enhanced fire access for emergency apparatus described herein.

Response times from LFPD's fire station #3 to the furthest structure of the project would be approximately 5.0 minutes. The response time from Station #3 meets the standard identified by the County General Plan. This assessment and recommendation is made for the following reasons:

5.1.1 Ignition-resistant construction requirements will provide critical improvements to all structures for them to survive a worst-case scenario fire storm in this area.

5.1.2 All buildings will be fully protected with automatic fire sprinkler systems.

5.1.3 A 100-foot Fuel Modification Zone will be provided around all residential structures of the development by way of fuel modification and the residential properties that abut the Brightwater site.

5.1.4 The capacity and capability of LFPD to respond to emergency incidents on the project.

5.1.6 The project's water supply which meets the requirements of LFPD, the San Diego County's Consolidated Fire Code and the Fire Code for a residential development.

5.1.7 Sufficient mitigation measures that minimize fire hazards are included in the project.

5.1.8 Fire apparatus access to the project will meet or exceed the requirements of the county and Lakeside Fire Protection District for public road standards.

5.2 Emergency Road Access

The road access requirements for this project will be adequate and fire code compliant in terms of access and construction standards for roadways. The project, then, will meet the requirements of the County and Lakeside Fire Protection District with respect to access.

5.3 Enhanced Fire-resistive Building Materials and Construction Measures

The prescribed ignition-resistant construction for all structures will provide significant protection in this fire hazard zone. The ignition-resistant construction requirements will provide critical improvements to structures for them to survive a worst-case scenario fire storm in this rural area.

Another significant requirement will be that the maintenance and repair of these proposed residences will be with the same ignition-resistant materials and construction features. In addition, the FPP requires that ignition-resistant construction will apply to mitigate the ignitability of all future proposed structures and projections (exterior balconies, carports, decks, patio covers, unenclosed roofs and floors).

5.4 Fuel Management Zones

The requirements of this FPP provide the fuel modification standards which mitigate the exposure of people to a significant risk of loss, injury or death. The setback area and fuel modification criteria prescribed provides a defensible space zone for fire suppression forces and will protect structures from radiant and convective heat.

The project demonstrates compliance with applicable fire regulations, including but not limited to the California Fire Code, California Code of Regulations, County Fire Code, or the County Consolidated Fire Code.

6.0 LIST OF PREPARERS, PERSONS, AND ORGANIZATIONS CONTACTED

6.1 List of Preparers

The principal author and preparer of this Brightwater Project Fire Protection Plan is C. Douglas Pumphrey, Senior Wildland Fire Associate of ***FIREWISE* 2000, Inc**., and certified by David C. Bacon, President of ***FIREWISE* 2000, Inc.** and a San Diego County Planning and Development Services (PDS) certified wildland fire consultant.

6.2 List of Persons Contacted During the Course of this Project

Camille Passon, AICP, Associate Planner for Project Design Consultants
Karl Osmundson, Biology Group Manager, HELIX Environmental Planning, Inc.
James Pine, Deputy Fire Marshal, San Diego County Fire Authority

APPENDIX 'A'

County of San Diego
Acceptable Plants For Defensible Space
In Fire Prone Areas

APPENDIX 'A'

COUNTY OF SAN DIEGO
ACCEPTABLE PLANTS FOR DEFENSIBLE SPACE
IN FIRE PRONE AREAS

ALL NATIVE PLANTS ON THE FOLLOWING LIST are considered to be drought-tolerant in the particular climate zone they are found. Those that grow best in riparian areas, as indicated by the "R", are generally the least drought-tolerant plants on the list.

SPECIAL NOTE: When planting, it is necessary to water deeply to encourage the plant roots to seek natural moisture in the soil. This watering should continue for at least three years to allow the plants to naturalize. More water should be provided in summer and less (if any) in the winter. These plants should be weaned off the supplemental irrigation and become less dependent on it over the establishment period.

No plant is totally fire resistant. The plants listed were chosen due to their high water content, minimum amount of flammable resins and/or low fuel volume.

Definitions:

Defensible Space: The area around a structure, where material capable of causing fire has been cleared, reduced or changed, to act as a barrier between an advancing fire and the structure.

Drought-Tolerant Plant Materials: Trees, shrubs, groundcovers, and other vegetation capable of sustained growth and reproduction with only natural moisture. Occasional supplemental irrigation is necessary only in extreme drought situations.

Establishment Period: The time it takes for a plant to become drought-resistant. This is usually a period of three years and is the time when supplemental irrigation is necessary.

Native or Naturalizing Plant Species: Plant species native to the region or introduced which, once established, are capable of sustaining growth and reproduction under local climatic conditions without supplemental irrigation.

FIRE*WISE* **2000, Inc. Note:** The plant list which follows was developed using the plants found on the San Diego County approved plant list. This list was then compared to those plants which are suitable for the climatic zone in which the project is located. Only those plants suitable for the project area listed below. The list is therefore shorter than that provided by the County. By providing this custom list, plants that are likely to be killed or seriously damaged by frost or will not perform in hot dry conditions have been eliminated. ***FIRE****WISE* **2000, Inc.** believes that the planting of species suited to the site is essential to fire management goals and is an environmentally sound practice.

Customized Acceptable Plant List for the Brightwater Project

Type	Genus	Species	Common Name
Annual	Lupinus spp.	nanus	Lupine
Groundcover	Achillea	millefolium	Yarrow
Groundcover	ArctostaphyLas spp.		Manzanita
Groundcover	Cerastium	tomentosum	Snow-in-Summer
Groundcover	Coprosma	kirkii	Creeping Coprosma
Groundcover	Cotoneaster spp.		Redberry
Groundcover	Drosanthemum	hispidum	Rosea Ice Plant
Groundcover	Dudleya	virens	Island Live-Forever
Groundcover	Eschscholzia	californica	California Poppy
Groundcover	Ferocactus	viridescens	Coast Barrel Cactus
Groundcover	Gaillardia	grandiflora	Blanket Flower
Groundcover	Gazania spp.		Gazania
Groundcover	Helianthemum spp.		Sunrose
Groundcover	Lantana spp.		Lantana
Groundcover	Lasthenia	californica	Common Goldfields
Groundcover	Lasthenia	glabrata	Coastal Goldfields
Groundcover	Lupinus spp.		Lupine
Groundcover	Pyracantha spp.		Firethorn
Groundcover	Rosmarinus	officinalis	Rosemary
Groundcover	Santolina	chamaecyparissus	Lavender Cotton
Groundcover	Trifolium	frageriferum	O'Connor's Legume
Groundcover	Verbena	rigida	Verbena
Groundcover	Viguiera	laciniata	San Diego Sunflower
Groundcover	Vinca	major	Periwinkle
Groundcover	Vinca	minor	Dwarf Periwinkle
Perennial	Coreopsis	grandiflora	Coreopsis
Perennial	Coreopsis	maritima	Sea Dahlia
Perennial	Coreopsis	verticillata	Coreopsis
Perennial	Heuchera	maxima	Island Coral Bells
Perennial	Iris	douglasiana	Douglas Iris
Perennial	Kniphofia	uvaria	Red-Hot Poker
Perennial	Lavandula spp.		Lavender
Perennial	Penstemon spp.		Penstemon
Perennial	Satureja	douglasii	Yerba Buena
Perennial	Sisyrinchium	bellum	Blue-Eyed Grass
Perennial	Sisyrinchium	californicum	Golden-Eyed Grass
Perennial	Solanum	xantii	Purple Nightshade
Perennial	Zauschneria	'Catalina'	Catalina Fuschia
Perennial	Zauschneria	californica	California Fuschia
Perennial	Zauschneria	cana	Hoary California Fuschia
Shrub	Agave	americana	Desert Century Plant
Shrub	Agave	Amorpha fruticosa	False Indigobush
Shrub	Agave	deserti	Shaw's Century Plant
Shrub	Agave	shawii	NCN
Shrub	Agave		Century Plant
Shrub	Arbutus	menziesii	Madrone
Shrub	ArctostaphyLas spp.		Manzanita
Shrub	Atriplex	canescens	Hoary Saltbush
Shrub	Atriplex	lentiformis	Quail Saltbush

Shrub	Baccharis	pilularis	Coyote Bush
Shrub	Baccharis	salicifolia	Mule Fat "R"
Shrub	Carissa	macrocarpa	Natal Plum
Shrub	Ceanothus spp.		California Lilac
Shrub	Cistus spp.		Rockrose
Shrub	Cneoridium	dumosum	Bush rue
Shrub	Comarostaphylis	diversifolia	Summer Holly
Shrub	Convolvulus	cneorum	Bush Morning Glory
Shrub	Elaeagnus	pungens	Silverberry
Shrub	Encelia	californica	Coast Sunflower
Shrub	Encelia	farinosa	White Brittlebush
Shrub	Eriobotrya	deflexa	Bronze Loquat
Shrub	Eriophyllum	confertiflorum	Golden Yarrow
Shrub	Escallonia spp.		Escallonia
Shrub	Feijoa	sellowiana	Pineapple Guava
Shrub	Fouqueria	splendens	Ocotillo
Shrub	Fremontodendron	californicum	Flannelbush
Shrub	Fremontodendron	mexicanum	Southern Flannelbush
Shrub	Galvezia	juncea	Baja Bush-Snapdragon
Shrub	Galvezia	speciosa	Island Bush-Snapdragon
Shrub	Garrya	elliptica	Coast Silktassel
Shrub	Garrya	flavescens	Ashy Silktassel
Shrub	Heteromeles	arbutifolia	Toyon
Shrub	Lantana spp.		Lantana
Shrub	Lotus	scoparius	Deerweed
Shrub	Mahonia spp.		Barberry
Shrub	Malacothamnus	clementinus	San Clemente Island Bush
Shrub	Malacothamnus	fasciculatus	Mesa Bushmallow
Shrub	Melaleuca spp.		Melaleuca
Shrub	Mimulus spp.		Monkeyflower
Shrub	Nolina	parryi	Parry's Nolina
Shrub	Photinia spp.		Photinia
Shrub	Pittosporum	rhombifolium	Queensland Pittosporum
Shrub	Pittosporum	tobira 'Wheeleri'	Wheeler's Dwarf
Shrub	Plumbago	auriculata	Cape Plumbago
Shrub	Prunus	caroliniana	Carolina Laurel Cherry
Shrub	Prunus	ilicifolia	Hollyleaf Cherry
Shrub	Prunus	lyonii	Catalina Cherry
Shrub	Puncia	granatum	Pomegranate
Shrub	Pyracantha spp.		Firethorn
Shrub	Rhamus	alaternus	Italian Buckthorn
Shrub	Rhamus	californica	Coffeeberry
Shrub	Rhaphiolepis spp.		Rhaphiolepis
Shrub	Rhus	continus	Smoke Tree
Shrub	Rhus	ovata	Sugarbush
Shrub	Rhus	trilobata	Squawbush
Shrub	Romneya	coulteri	Matilija Poppy
Shrub	Rosa	californica	California Wild Rose
Shrub	Rosa	minutifolia	Baja California Wild Rose
Shrub	Salvia spp.		Sage
Shrub	Sambucus spp.		Elderberry
Shrub	Symphoricarpos	mollis	Creeping Snowberry
Shrub	Syringa	vulgaris	Lilac
Shrub	Teucrium	fruticans	Bush Germander

Shrub	Verbena	lilacina	Lilac Verbena
Shrub	XyLasma	congestum	Shiny XyLasma
Shrub	Yucca	schidigera	Mojave Yucca
Shrub	Yucca	whipplei	Foothill Yucca
Tree	Acer	macrophyllum	Big Leaf Maple
Tree	Acer	saccarum	Sugar Maple
Tree	Acer	saccharinum	Silver Maple
Tree	Alnus	rhombifolia	White Alder "R"
Tree	Arbutus	unedo	Strawberry Tree
Tree	Brahea	edulis	Guadalupe Palm
Tree	Ceratonia	siliqua	Carob
Tree	Cercis	occidentalis	Western Redbud
Tree	Cerdidium	floridum	Blue Palo Verde
Tree	Cornus	nuttallii	Mountain Dogwood
Tree	Cornus	stolonifera	Redtwig Dogwood
Tree	Elaeagnus	angustifolia	Russian Olive
Tree	Eriobotrya	japonica	Loquat
Tree	Gingko	biloba "Fairmount"	Fairmount Maidenhair Tree
Tree	Gleditisia	triacanthos	Honey Locust
Tree	Juglans	californica	California Walnut
Tree	Juglans	hindsii	California Black Walnut
Tree	Lagerstroemia	indica	Crape Myrtle
Tree	Ligustrum	lucidum	GLassy Privet
Tree	Liquidambar	styraciflua	Sweet Gum
Tree	Liriodendron	tulipifera	Tulip Tree
Tree	Melaleuca spp.		Melaleuca
Tree	Nerium	oleander	Oleander
Tree	Parkinsonia	aculeata	Mexican Palo Verde
Tree	Pistacia	chinensis	Chinese Pistache
Tree	Pistacia	vera	Pistachio Nut
Tree	Pittosporum	phillyreoides	Willow Pittosporum
Tree	Platanus	acerifolia	London Plane Tree
Tree	Platanus	racemosa	California Sycamore "R"
Tree	Populus	alba	White Poplar
Tree	Populus	fremontii	Western Cottonwood "R"
Tree	Populus	trichocarpa	Black Cottonwood "R"
Tree	Prunus	caroliniana	Carolina Laurel Cherry
Tree	Prunus	cersifera ‘Newport’	Newport Purple-Leaf Plum
Tree	Prunus	ilicifolia	Hollyleaf Cherry
Tree	Prunus	lyonii	Catalina Cherry
Tree	Prunus	serrulata ‘Kwanzan’	Flowering Cherry
Tree	Prunus	xblireiana	Flowering Plum
Tree	Prunus	yedoensis ‘Akebono’	Akebono Flowering Cherry
Tree	Quercus	agrifolia	Coast Live Oak
Tree	Quercus	engelmannii	Engelmann Oak
Tree	Quercus	suber	Cork Oak
Tree	Rhus	lancea	African Sumac
Tree	Salix spp.		Willow "R"
Tree	Ulmus	parvifolia	Chinese Elm
Tree	Ulmus	pumila	Siberian Elm
Tree	Umbellularia	californica	California Bay Laurel "R"
Vine	Antigonon	leptopus	San Miguel Coral Vine
Vine	Distictis	buccinatoria	Blood-Red Trumpet Vine
Vine	Keckiella	cordifolia	Heart-Leaved Penstemon

Vine	Lonicera	japonica ‘Halliana’	Hall’s Honeysuckle
Vine	Lonicera	subspicata	Chaparral Honeysuckle
Vine	Solanum	jasminoides	Potato Vine

APPENDIX 'B'

Undesirable Plant List

UNDESIRABLE PLANT LIST

The following species are highly flammable and should be avoided when planting within the first 50 feet adjacent to a structure. The plants listed below are 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. Many of these species, if existing on the property and adequately maintained (pruning, thinning, irrigation, litter removal, and weeding), may remain as long as the potential for spreading a fire has been reduced or eliminated.

BOTANICAL NAME	COMMON NAME
Abies species	Fir Trees
Acacia species	Acacia (trees, shrubs, groundcovers)
Adenostoma sparsifolium**	Red Shanks
Adenostoma fasciculatum**	Chamise
Agonis juniperina	Juniper Myrtle
Araucaria species	Monkey Puzzle, Norfolk Island Pine
Artemesia californica**	California Sagebrush
Bambusa species	Bamboo
Cedrus species	Cedar
Chamaecyparis species	False Cypress
Coprosma pumila	Prostrate Coprosma
Cryptomeria japonica	Japanese Cryptomeria
Cupressocyparis leylandii	Leylandii Cypress
Cupressus forbesii**	Tecate Cypress
Cupressus glabra	Arizona Cypress
Cupressus sempervirens	Italian Cypress
Dodonea viscosa	Hopseed Bush
Eriogonum fasciculatum**	Common Buckwheat
Eucalyptus species	Eucalyptus
Heterotheca grandiflora**	Telegraph Plant
Juniperus species	Junipers
Larix species	Larch
Lonicera japonica	Japanese Honeysuckle
Miscanthus species	Eulalia Grass
Muehlenbergia species**	Deer Grass
Palmae species	Palms
Picea species	Spruce Trees
Pickeringia Montana**	Chaparral Pea
Pinus species	Pines
Podocarpus species	Fern Pine
Pseudotsuga menziesii	Douglas Fir
Rosmarinus species	Rosemary
Salvia mellifera**	Black Sage
Taxodium species	Cypress
Taxus species	Yew
Thuja species	Arborvitae
Tsuga species	Hemlock
Urtica urens**	Burning Nettle

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APPENDIX 'C'

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APPENDIX 'C'

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APPENDIX 'D'

BEHAVEPLUS VERSION 5.0.5
FIRE BEHAVIOR CALCULATIONS

Fire Scenario 1 – Normal/typical 12 MPH Winds Along Southwest Exposures

Fire Scenario 2 - 30 MPH Above Average Prevailing Wind Conditions Along Southwest and West Exposures

Fire Scenario 3 - 60 MPH Northeast Winds (Santa Ana Winds) Along North and Northeast Exposures

BehavePlus 5.0.5 (Build 307)

BRIGHTWATER_SCAL18_SW12MPH-UNTREATED

Fri, Jul 11, 2014 at 18:37:48

Input Worksheet

Inputs: SURFACE

Input Variables	Units	Input Value(s)
Fuel/Vegetation, Surface/Understory		
Fuel Model		SCAL18
Fuel Moisture		
1-h Moisture	%	2
10-h Moisture	%	3
100-h Moisture	%	5
Live Herbaceous Moisture	%	30
Live Woody Moisture	%	50
Weather		
Midflame Wind Speed (upslope)	mi/h	4.8
Terrain		
Slope Steepness	%	40

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 is blowing upslope [SURFACE].

Results

Output Variable	Value	Units

Surface Rate of Spread (maximum)	81.1	ft/min
Fireline Intensity	5892	Btu/ft/s
Flame Length	24.4	ft

BehavePlus 5.0.5 (Build 307)

BRIGHTWATER_sh1_SW12MPH-TREATED

Fri, Jul 11, 2014 at 18:20:41

Input Worksheet

Inputs: SURFACE

Input Variables	Units	Input Value(s)
Fuel/Vegetation, Surface/Understory		
Fuel Model		sh1
Fuel Moisture		
1-h Moisture	%	2
10-h Moisture	%	3
100-h Moisture	%	5
Live Herbaceous Moisture	%	30
Live Woody Moisture	%	50
Weather		
Midflame Wind Speed (upslope)	mi/h	4.8
Terrain		
Slope Steepness	%	40

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 is blowing upslope [SURFACE].

Results

Output Variable	Value	Units
Surface Rate of Spread (maximum)	25.8	ft/min
Fireline Intensity	184	Btu/ft/s
Flame Length	5.0	ft

BehavePlus 5.0.5 (Build 307)

BRIGHTWATER_SCAL18_SW30MPH-UNTREATED

Fri, Jul 11, 2014 at 18:40:41

Input Worksheet

Inputs: SURFACE

Input Variables	Units	Input Value(s)
Fuel/Vegetation, Surface/Understory		
Fuel Model		SCAL18
Fuel Moisture		
1-h Moisture	%	2
10-h Moisture	%	3
100-h Moisture	%	5
Live Herbaceous Moisture	%	30
Live Woody Moisture	%	50
Weather		
Midflame Wind Speed (upslope)	mi/h	12
Terrain		
Slope Steepness	%	40

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 is blowing upslope [SURFACE].

Results

Output Variable	Value	Units
Surface Rate of Spread (maximum)	166.9	ft/min
Fireline Intensity	12125	Btu/ft/s
Flame Length	34.0	ft

BehavePlus 5.0.5 (Build 307)

BRIGHTWATER_sh1_SW30MPH-TREATED

Fri, Jul 11, 2014 at 18:14:52

Input Worksheet

Inputs: SURFACE

Input Variables	Units	Input Value(s)
Fuel/Vegetation, Surface/Understory		
Fuel Model		sh1
Fuel Moisture		
1-h Moisture	%	2
10-h Moisture	%	3
100-h Moisture	%	5
Live Herbaceous Moisture	%	30
Live Woody Moisture	%	50
Weather		
Midflame Wind Speed (upslope)	mi/h	12
Terrain		
Slope Steepness	%	40

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 is blowing upslope [SURFACE].

Results

Output Variable	Value	Units
Surface Rate of Spread (maximum)	76.3	ft/min
Fireline Intensity	545	Btu/ft/s
Flame Length	8.2	ft

BehavePlus 5.0.5 (Build 307)

BRIGHTWATER_SCAL18_NE60MPH-UNTREATED

Fri, Jul 11, 2014 at 18:34:59

Input Worksheet

Inputs: SURFACE

Input Variables	Units	Input Value(s)
Fuel/Vegetation, Surface/Understory		
Fuel Model		SCAL18
Fuel Moisture		
1-h Moisture	%	2
10-h Moisture	%	3
100-h Moisture	%	5
Live Herbaceous Moisture	%	30
Live Woody Moisture	%	50
Weather		
Midflame Wind Speed (upslope)	mi/h	24
Terrain		
Slope Steepness	%	40

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 is blowing upslope [SURFACE].

Results

Output Variable	Value	Units
Surface Rate of Spread (maximum)	301.7	ft/min
Fireline Intensity	21917	Btu/ft/s
Flame Length	44.7	ft

BehavePlus 5.0.5 (Build 307)

BRIGHTWATER_sh1_NE60MPH-TREATED

Fri, Jul 11, 2014 at 18:17:09

Input Worksheet

Inputs: SURFACE

Input Variables	Units	Input Value(s)
Fuel/Vegetation, Surface/Understory		
Fuel Model		sh1
Fuel Moisture		
1-h Moisture	%	2
10-h Moisture	%	3
100-h Moisture	%	5
Live Herbaceous Moisture	%	30
Live Woody Moisture	%	50
Weather		
Midflame Wind Speed (upslope)	mi/h	24

Terrain

Slope Steepness	%	40

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 is blowing upslope [SURFACE].

Results

Output Variable	Value	Units
Surface Rate of Spread (maximum)	134.9	ft/min
Fireline Intensity	964	Btu/ft/s
Flame Length	10.6	ft

APPENDIX 'E'

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

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

- Wall coverings
- Balconies
- Decks
- Stairways
- Fences
- Sheds
- Gazebos
- Roof coverings
- Open-air roof systems
- Canopies and awnings
- Storefronts and facades
- Eaves, soffits and fascia
- Agricultural buildings and horse stalls
- Scaffolding and scaffold planks
- Construction staging
- Various other residential and commercial uses

Decking (SFM Standard 12-7A-4) Other products can be searched at:
http://osfm.fire.ca.gov/licensinglistings/licenselisting_bml_searchcotest.php

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

III. TREX COMPANY, INC –"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/in^3.

IV.

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)

V. SOLID "WOOD" DECKING (refer to San Diego County Building Division for specific building materials).

VI. VINYL FENCE (not included in Chapter 7A)

The proposed project may use a combination of steel tube fencing at rear of house and vinyl fencing for side yards. The following information is provided on the combustibility of vinyl fencing.

Source: http://firecenterbeta.berkeley.edu/bwmg/attachments-1.html

Depending on material and location, fencing can increase or decrease the vulnerability of a building to wildfire. A solid perimeter fence made of noncombustible materials (such as steel or concrete) has been shown to be an effective barrier against a radiant energy exposure from the fire front. Even a wood plank fence, if a high density species is selected and the boards are closely spaced, can provide some protection to the building from a purely radiant exposure. Depending on the pre-fire exposure, however, vegetative debris at the base of a combustible fence could result in ignition, as would direct flame contact.

[Leonard, J. et al. 2006. Research and Investigation into the Performance of Residential Boundary Fencing Systems in Bushfires, Bushfire CRC, Report CMIT 2006-186]

In this fire demonstration, a vinyl lattice fence, connected to a wood clad wall, was ignited with at burning standard 'A' brand. As is shown in the following photograph, fire did not spread to the wall, even though fine combustible debris was stuffed into areas in the lattice fence.

The vinyl lattice fence deformed, but did not sustain combustion after the 'A' brand burned out, and did not spread fire to the combustible wood wall.

APPENDIX 'F'

Fire and Water Project Availability Forms

County of San Diego, Planning & Development Services
PROJECT FACILITY AVAILABILITY - FIRE
ZONING DIVISION

F

Please type or use pen

Sohail Bokhari-Pulte Homes 949-330-8537
Owner's Name Phone

2701 Puerta Real Ste 300
Owner's Mailing Address Street

Mission Viejo, CA 92691
City State Zip

ORG
ACCT
ACT
TASK
DATE
AMT $
DISTRICT CASHIER'S USE ONLY

SECTION 1. PROJECT DESCRIPTION — **TO BE COMPLETED BY APPLICANT**

A. ☑ Major Subdivision (TM) ☐ Specific Plan or Specific Plan Amendment
☐ Minor Subdivision (TPM) ☐ Certificate of Compliance
☐ Boundary Adjustment
☐ Rezone (Reclassification) from ____ to ____ zone
☐ Major Use Permit (MUP), purpose:
☐ Time Extension...Case No.
☐ Expired Map...Case No.
☐ Other

B. ☑ Residential ... Total number of dwelling units 69
☐ Commercial ... Gross floor area
☐ Industrial ... Gross floor area
☐ Other ... Gross floor area

C. Total Project acreage ____ Total lots 70 Smallest proposed lot 10,000 Sq Ft

Assessor's Parcel Number(s) (Add extra if necessary)

397-180-13	

Thomas Guide, Page 1232 Grid B7:C7

Project address Street

Lakeside
Community Planning Area/Subregion Zip

OWNER/APPLICANT AGREES TO COMPLETE ALL CONDITIONS REQUIRED BY THE DISTRICT.

Applicant's Signature: [signature] Date: APR 29 2014

Address: 2701 Puerta Real Ste 300 MV, CA 92691 Phone: 949-330-8537

(On completion of above, present to the district that provides fire protection to complete Section 2 and 3 below.)

SECTION 2: FACILITY AVAILABILITY — **TO BE COMPLETED BY DISTRICT**

District Name: Lakeside FPD

Indicate the location and distance of the primary fire station that will serve the proposed project:
FS 3, 14008 Hwy 8 Business, 2.5miles

A. ☑ Project is in the District and eligible for service.
☐ Project is not in the District but is within its Sphere of Influence boundary, owner must apply for annexation.
☐ Project is not in the District and not within its Sphere of Influence boundary.
☐ Project is not located entirely within the District and a potential boundary issue exists with the ____ District.

B. ☑ Based on the capacity and capability of the District's existing and planned facilities, fire protection facilities are currently adequate or will be adequate to serve the proposed project. The expected emergency travel time to the proposed project is 4.5 minutes.

☐ Fire protection facilities are not expected to be adequate to serve the proposed development within the next five years.

C. ☐ District conditions are attached. Number of sheets attached:
☑ District will submit conditions at a later date.

SECTION 3. FUELBREAK REQUIREMENTS

Note: The fuelbreak requirements prescribed by the fire district for the proposed project do not authorize any clearing prior to project approval by Planning & Development Services.

☑ Within the proposed project 100 feet of clearing will be required around all structures.
☐ The proposed project is located in a hazardous wildland fire area, and additional fuelbreak requirements may apply. Environmental mitigation requirements should be coordinated with the fire district to ensure that these requirements will not pose fire hazards.

This Project Facility Availability Form is valid until final discretionary action is taken pursuant to the application for the proposed project or until it is withdrawn, unless a shorter expiration date is otherwise noted.

[signature] James Pine, DFM 858-495-5984 5/13/14
Authorized Signature Print Name and Title Phone Date

On completion of Section 2 and 3 by the District, applicant is to submit this form with application to:
Planning & Development Services – Zoning Counter, 5510 Overland Ave, Suite 110, San Diego, CA 92123

PDS-399F (Rev. 09/21/2012)

County of San Diego, Planning & Development Services
PROJECT FACILITY AVAILABILITY - WATER
ZONING DIVISION

THIS APPROVAL IS SUBJECT TO ALL HELIX WATER DISTRICT REQUIREMENTS IN EFFECT AT THE TIME OF APPLICATION FOR SERVICE.

Please type or use pen

Sohail Bokhari - Pulte Homes 949-330-8537
Owner's Name Phone

2701 Puerta Real Ste 300
Owner's Mailing Address Street

Mission Viejo, CA 92691
City State Zip

ORG
ACCT
ACT
TASK
DATE
AMT $

W

DISTRICT CASHIER'S USE ONLY

SECTION 1. PROJECT DESCRIPTION — TO BE COMPLETED BY APPLICANT

A. ☑ Major Subdivision (TM) ☐ Specific Plan or Specific Plan Amendment
☐ Minor Subdivision (TPM) ☐ Certificate of Compliance
☐ Boundary Adjustment
☐ Rezone (Reclassification) from ____ to ____ zone
☐ Major Use Permit (MUP), purpose
☐ Time Extension...Case No.
☐ Expired Map Case No.
☐ Other

B. ☑ Residential Total number of dwelling units 69
☐ Commercial Gross floor area
☐ Industrial Gross floor area
☐ Other Gross floor area

C. ☐ Total Project acreage ____ Total number of lots 70

D. Is the project proposing the use of groundwater? ☐ Yes ☒ No
Is the project proposing the use of reclaimed water? ☐ Yes ☒ No

Assessor's Parcel Number(s) (Add extra if necessary)

397-180-13	

Thomas Guide Page 1232 Grid B7/C7

Project address Street

Lakeside
Community Planning Area/Subregion Zip

Owner/Applicant agrees to pay all necessary construction costs, dedicate all district required easements to extend service to the project and COMPLETE ALL CONDITIONS REQUIRED BY THE DISTRICT.

Applicant's Signature: [signature] Date: APR 29 2014

Address: 2701 Puerta Real Ste 300 MV, CA 92691 Phone 949-330-8537

(On completion of above, present to the district that provides water protection to complete Section 2 below.)

SECTION 2: FACILITY AVAILABILITY — TO BE COMPLETED BY DISTRICT

District Name: HELIX WATER DISTRICT Service area TUNNEL HILL

A. ☒ Project is in the district.
☐ Project is not in the district but is within its Sphere of Influence boundary, owner must apply for annexation.
☐ Project is not in the district and is not within its Sphere of Influence boundary.
☐ The project is not located entirely within the district and a potential boundary issue exists with the ____ District.

B. ☒ Facilities to serve the project ☒ ARE ☐ ARE NOT reasonably expected to be available within the next 5 years based on the capital facility plans of the district. Explain in space below or on attached ____ (Number of sheets)
☐ Project will not be served for the following reason(s):

C. ☐ District conditions are attached. Number of sheets attached:
☐ District has specific water reclamation conditions which are attached. Number of sheets attached:
☒ District will submit conditions at a later date.

D. ☐ How far will the pipeline(s) have to be extended to serve the project?

This Project Facility Availability Form is valid until final discretionary action is taken pursuant to the application for the proposed project or until it is withdrawn, unless a shorter expiration date is otherwise noted.

Authorized Signature [signature] Print Name CARLOS PEREDMO

Print Title SR. ENGINEERING TECH Phone 619-667-6239 Date 5/2/14

NOTE: THIS DOCUMENT IS NOT A COMMITMENT OF SERVICE OR FACILITIES BY THE DISTRICT
On completion of Section 2 and 3 by the District, applicant is to submit this form with application to Planning & Development Services – Zoning Counter, 5510 Overland Ave, Suite 110, San Diego, CA 92123

PDS-399W (Rev. 09/21/2012)

APPENDIX 'G'

Project Site Photos

Photo 1: Westerly View of Project Taken from Wellington Hill Drive

Photo 2: Northwesterly View Along Northeast Boundary

Photo 3: View of Typical Native Fuels On-Site

Photo 4: View of Proposed Lots and the Adjacent Steeper Open Space Lot

Photo 5: A Southeast View of Natural Vegetation

Photo 6: View of Eastern Boundary and Adjacent Residential Development

Photo 7: View of Existing Non-Native Olive Tree

Photo 8: View of Eastern Boundary-Adjacent to Approved Development Project

EXHIBIT 1

Fuel Treatment Location Map

(See Larger Scale Map Attached)