SWEETWATER VISTAS
FIRE PROTECTION PLAN

Project No. PDS2015-GPA-15-006, PDS2015-SPA-15-002, PDS2015-TM-5608, PDS2015-REZ-15-008, PDS2015-MUP-89-015W4, and PDS2015-STP-15-016

Prepared for:

County of San Diego
Planning and Development Services
5510 Overland Avenue
San Diego, California 92123

Project Proponent:

Sweetwater Vistas, LLC
1620 Fifth Ave. Suite 400
San Diego, California 92101
Contact: Terry Plowden, Senior Managing Director

Prepared by:

DUDEK
605 Third Street
Encinitas, California 92024

Preparer's Signature: 

OCTOBER 2016

Printed on 30% post-consumer recycled material.

TABLE OF CONTENTS

Section **Page No.**

TABLE OF CONTENTS (CONTINUED)

Section **Page No.**

APPENDICES

FIGURES

TABLE OF CONTENTS (CONTINUED)

Page No.

TABLES

INTENTIONALLY LEFT BLANK

EXECUTIVE SUMMARY

The Sweetwater Vistas Project is a proposed 218-unit residential development project located in unincorporated Spring Valley area of San Diego County, California. The proposed Project will be situated on 52.0 acres with residential development occurring at the northwest corner of Jamacha Boulevard and Sweetwater Springs Boulevard. The Project complies with Fire Code standards for private and public road widths and dead-end streets. The proposed development will include:

- A total of 218 residential units (two- and three-story buildings). All structures to be built to enhanced ignition-resistant construction standards;
- Driveways (streets), fire hydrants, and associated infrastructure;
- All driveways and streets widths are designed to accommodate an aerial ladder truck around exterior sides of the three-story units;
- Primary and secondary ingress/egress onto Jamacha Boulevard, Sweetwater Springs Boulevard or Avendia Bosques;
- Approved traffic calming features on Avendia Bosques are designed to enable emergency apparatus response; and
- On-site 100-foot wide fuel modification zones (FMZ). All FMZs are on site.

The Sweetwater Vistas property lies within an area considered a Very High Fire Hazard Severity Zone, as designated by California Department of Forestry and Fire Protection (CAL FIRE). The site is surrounded by privately owned, developed and undeveloped properties. The terrain on, and within the vicinity of the project, is characterized by moderately steep slopes, with gradients reaching up to 35%. The area, like all of San Diego County, is subject to seasonal weather conditions that can heighten the likelihood of fire ignition and spread, and, considering the site's terrain and vegetation, may result in fast moving and moderate-intensity wildfire.

The project site is within the jurisdiction of the San Miguel Consolidated Fire Protection District (SMCFPD). However, the Fire District has entered into a cooperative fire services agreement with CAL FIRE for dispatch and fire suppression services. SMCFPD operates two fire stations that would respond to an incident on the site, including Station Nos. 15 and 16. Response to the project site is approximately 1.0 mile from the site. Access within the development may require up to an additional 30 seconds, resulting in an approximately 3.0 minute response time to the most northwestern portion of the development. Station No. 16 will respond to an incident on the project site only if necessary. Therefore, emergency response travel time meets the general plan requirements for maximum allowable travel time of 5 minutes. The project will be constructed to the 2013 California Fire Code and Building Code (Chapter 7A), as adopted by SMCFPD.

Construction shall include enhanced ignition resistant features, automatic interior sprinklers, appropriate fire flow and water capacity, roads, and supporting infrastructure, and fuel modification areas. The project includes locations within Lots #1 and #3Lot #3 where meeting the top of slope structure setback for a two-story building is not possible. An alternative fire protection measure is provided that meets the intent of the setback in the form of a eight feet high, heat deflecting, non-combustible view wall at the top of slope and providing dual tempered pane windows on the exposed side of the buildings, as discussed in Section 6.0 of this Fire Protection Plan (FPP).

1 INTRODUCTION

This FPP has been prepared for The Sweetwater Vistas Project in unincorporated Spring Valley area of San Diego County, California. The purpose of the FPP is to assess the potential impacts resulting from wildland fire hazards and identify the measures necessary to adequately mitigate those impacts. Additionally, this plan generates and memorializes the fire safety requirements of the Fire Authority Having Jurisdiction (FAHJ), which is the SMCFPD with support by the San Diego County Fire Authority (SDCFA). Requirements and recommendations are based on site-specific characteristics and incorporate input from the project applicant and the FAHJ.

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), structural ignitability and fire resistive building features, fire protection systems and equipment, impacts to existing emergency services, defensible space, and vegetation management. The plan identifies and prioritizes areas for hazardous fuel reduction treatments and recommends the types and methods of treatment that will protect one or more at-risk communities and essential infrastructures. The plan recommends measures that property owners will take to reduce the probability of ignition of structures throughout the area addressed by the plan.

The following tasks were performed toward completion of this plan:

- Gather site specific climate, terrain, and fuel data;
- Process and analyze the data using the latest GIS technology;
- Predict fire behavior using scientifically based fire behavior models, comparisons with actual wildfires in similar terrain and fuels, and experienced judgment;
- Analyze and guide design of proposed infrastructure;
- Analyze the existing emergency response capabilities;
- Assess the risk associated with the proposed project and site;
- Prepare this FPP detailing how fire risk will be mitigated through a system of fuel modification, structural ignition resistance enhancements, and fire protection delivery system upgrades; and
- Site photographs were collected and fuel conditions were documented. Field observations were utilized to augment existing digital site data in generating the fire behavior models and formulating the recommendations presented in this FPP.

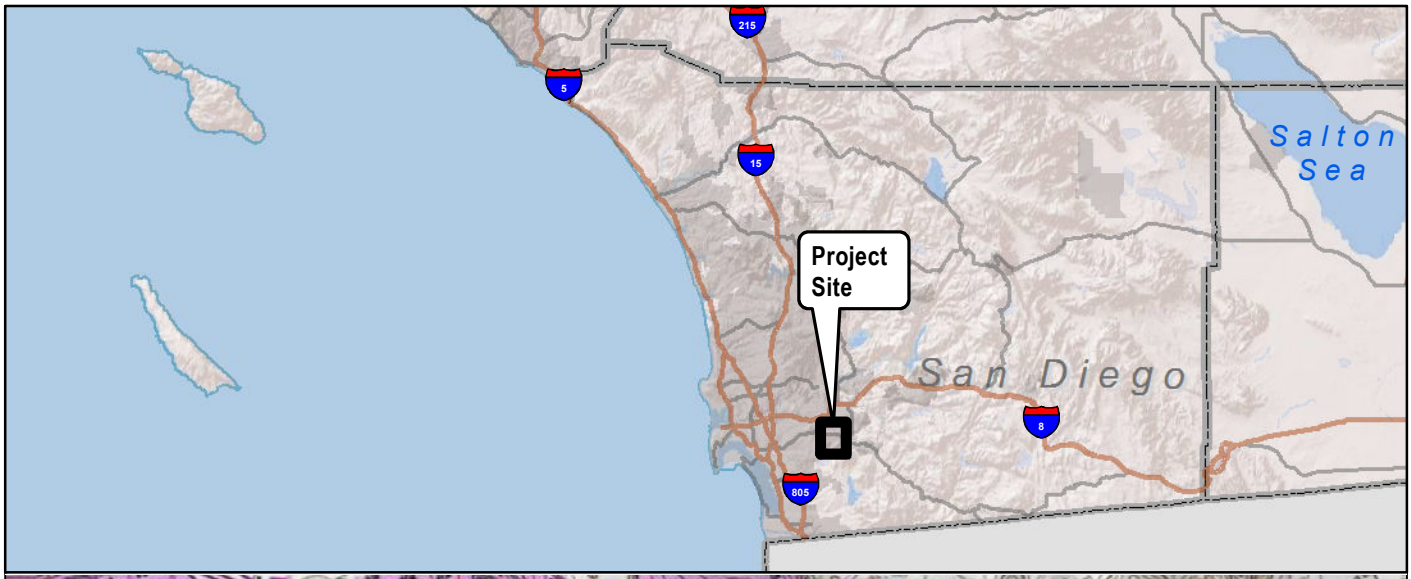
1.1 Applicable Codes/Existing Regulations

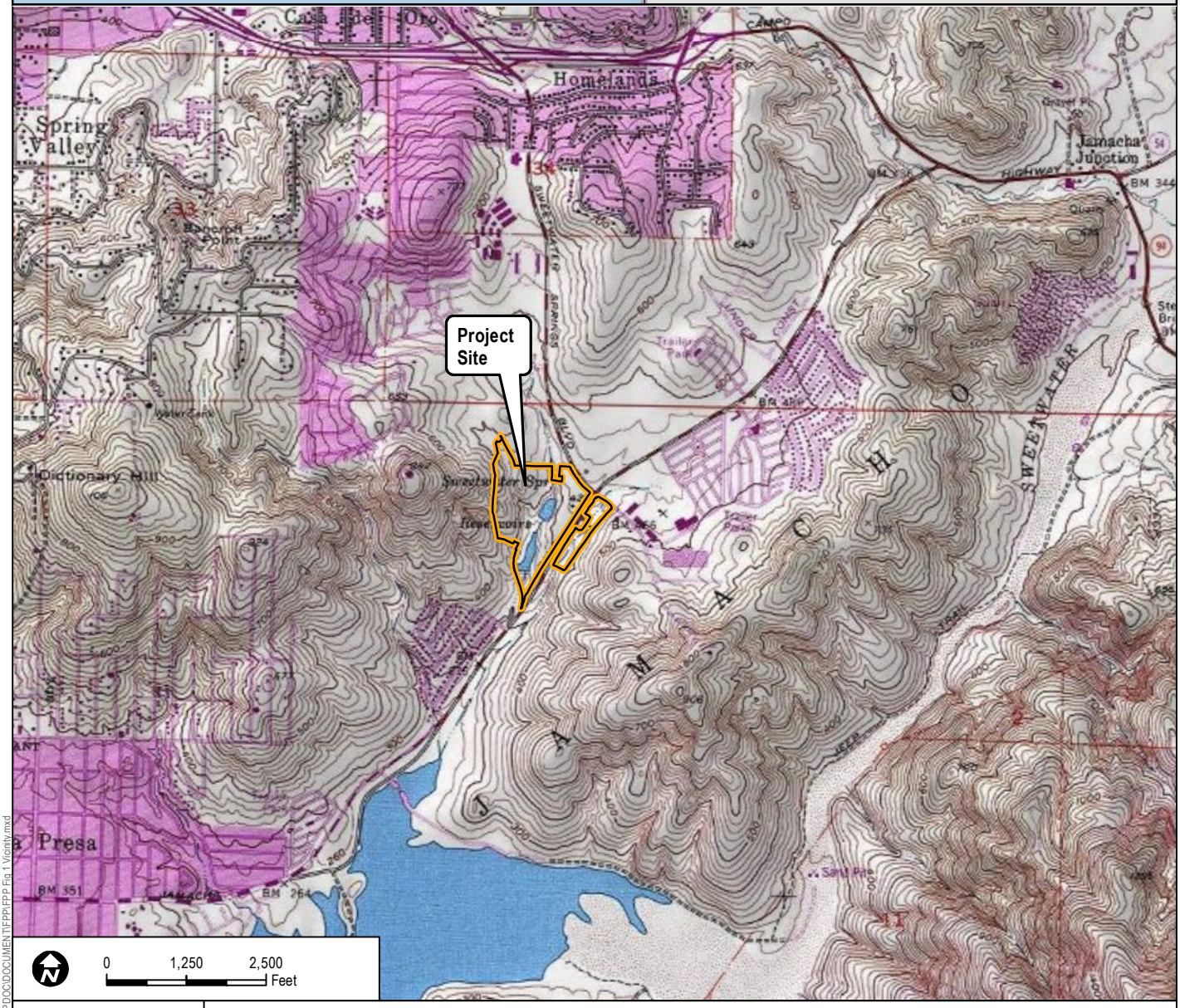
This FPP demonstrates that The Sweetwater Vistas Project will be in compliance with applicable portions of the 2014 San Diego County Consolidated Fire Code (SDCCFC) and the San Miguel Consolidated Fire Protection District's Ordinance Number 2013-1. The project will also be consistent with the 2013 California Building Code, Chapter 7A, 2013 California Fire Code, Chapter 49, and 2013 California Residential Code, Section 237 as adopted by San Diego County and the Fire District. Chapter 7A of the California Building Code focuses primarily on preventing ember penetration into homes, a leading cause of structure loss from wildfires. Thus, it is an important component of the requirements of this FPP given the Project's wildland urban interface location in which is within an area statutorily designated a Very High Fire Hazard Severity Zone (VHFHSZ) by CAL FIRE. Fire hazard designations are based on topography, vegetation, and weather, amongst other factors with more hazardous sites including steep terrain, unmaintained fuels/vegetation, and wildland urban interface (WUI) locations. As described in this FPP, the project will meet all applicable Code requirements, except for some areas that do not comply with structure setback standard discussed in Section 5.5.3: Structure Setback Requirements. Heat deflecting view walls will be installed at locations which do not achieve setbacks for structures facing open space areas. This additional fire protection measure would be determined to provide at least functional equivalency for structure setback requirement.

1.2 Project Summary

1.2.1 Location

The Sweetwater Vistas Project is located in the unincorporated community of Spring Valley in eastern San Diego County, California (Figure 1). Specifically, the project site consists of approximately 52.0 acres which is bisected by Jamacha Boulevard. A total of 43.4 acres of the project are located at the northwest corner of Jamacha Boulevard and Sweetwater Springs Boulevard (the *Western Parcel*) and 8.58 acres are located at the southeast corner of Jamacha Boulevard and Sweetwater Springs Boulevard, directly west of the Otay Water District offices (the *Eastern Parcel*). Sweetwater Reservoir is located approximately 0.5 mile southwest of the southerly portion of the site. The nearest residential developed areas are adjacent to and west or north of the property. The Project lies within Township 17 south, Range 1 west in a non-sectional area of the Jamul Mountain, U.S. Geographical Survey 7.5-minute quadrangle (dated 1955 and photo-revised in 1971 and 1975). Figure 2 provides the project's site plan including roads and access points. The Sweetwater Vistas project site is located on the following Assessor Parcel Numbers: 505-672-03, -07, -09, -10, -23, and -37.





DUDEK

SOURCE: USGS 7.5 Minute Series, Jamul Mountains Quadrangle

FIGURE 1
Vicinity Map

Sweetwater Vistas Project - Fire Protection Plan

Path: Z:\Projects\88541\MAPDOC\DOCUMENT\FPP\FPP Fig 1 Vicinity.mxd

INTENTIONALLY LEFT BLANK

SOURCE: FUSCOE ENGINEERING 2016

DUDEK

FIGURE 2

Proposed Site Plan

Sweetwater Vistas Project - Fire Protection Plan

Z:\Templates\Arcmap\Current\Vicinity\8x11 Vicinity Portrait.mxd

INTENTIONALLY LEFT BLANK

1.2.2 Project Description

The Sweetwater Vistas project proposes to construct a new master planned community consisting of 218 residential units. The project site encompasses approximately 52.05 acres, of which, approximately 27.9 acres will be permanent biological open space. The residential development to occur on the 43.47-acre *Western Parcel* will be divided into three development lots as illustrated on the Project Site Plan (Figure 2). Lots #1 and #2, which in aggregate total 143 units, will consist of two- and three-story residential condominiums, which are 35 feet to the center of the roof. Lot #3 totaling 75 units is designed with two-story residential condominiums. The existing site (*Western Parcel*) is primarily comprised of Diegan coastal sage scrub on moderately steep slopes and non-native and native riparian in the Hansen Creek drainage. Hansen Creek bisects the *Western Parcel* with Lots #1 and #2 to the west and Lot #3 to the east of the creek. In addition to the 218 residential units, the project will include other lots dedicated to public and private streets in addition to fuel modification zones (FMZ) and an eight-foot wide trail that would be constructed along Jamacha Boulevard along the property frontage. The Project also includes the extension of Avenida Bosques to connect to Pointe Parkway with a pathway constructed along the new segment of Avenida Bosques. Private streets and FMZs will be managed by the Homeowners Association (HOA). The project's streets include fire department turnarounds or are looped for the dead-end streets.

The 8.58-acre *Eastern Parcel* which contains Diegan coastal sage scrub, Southern willow scrub, mulefat scrub, and cismontane alkali marsh will be preserved as biological open space. Appendix A provides photographs of the site in its current, undeveloped condition.

1.3 Site Characteristics

1.3.1 Topography

The site is situated between the Jamacho and Jamul Mountain Ranges to the east and a group of no name hills to the west of the project site. Dictionary Hill or "Lookout Hill" is approximately 1.3 miles west of the property. Two small, interconnected reservoirs (Sweetwater Springs) occur in the middle of the site along Hansen's Creek, which drains through the property from the northeast to the southwest and eventually into the Sweetwater Reservoir. Elevations on the site range from 325 feet above mean sea level (AMSL) near the intersection of Pointe Parkway and Jamacha Boulevard to roughly 483 feet AMSL in the northwest corner of the property.

1.3.2 Existing/Vicinity Land Use

The project area is currently undeveloped and the dominant vegetation is Coastal Sage Scrub with a riparian forest in the middle of the property that traverse the site from the northern portion of the property to the southwest corner. There are two, old graded pads in the northeast corner near the intersection of Sweetwater Springs Blvd. and Jamacha Blvd. and at the terminus of Pointe Parkway in the western portion of the property. Over the years,

portions of the property have been used for various unauthorized land uses, including occasional dumping and homeless camps.

Land use surrounding the project site includes single-family residences to the north and west, commercial and retail to the north and northeast, industrial development, including the Otay Water District's Administrative Office, occurs to the east, and a residential development to the south. Vacant lands also occur between the site and development on the east and west.

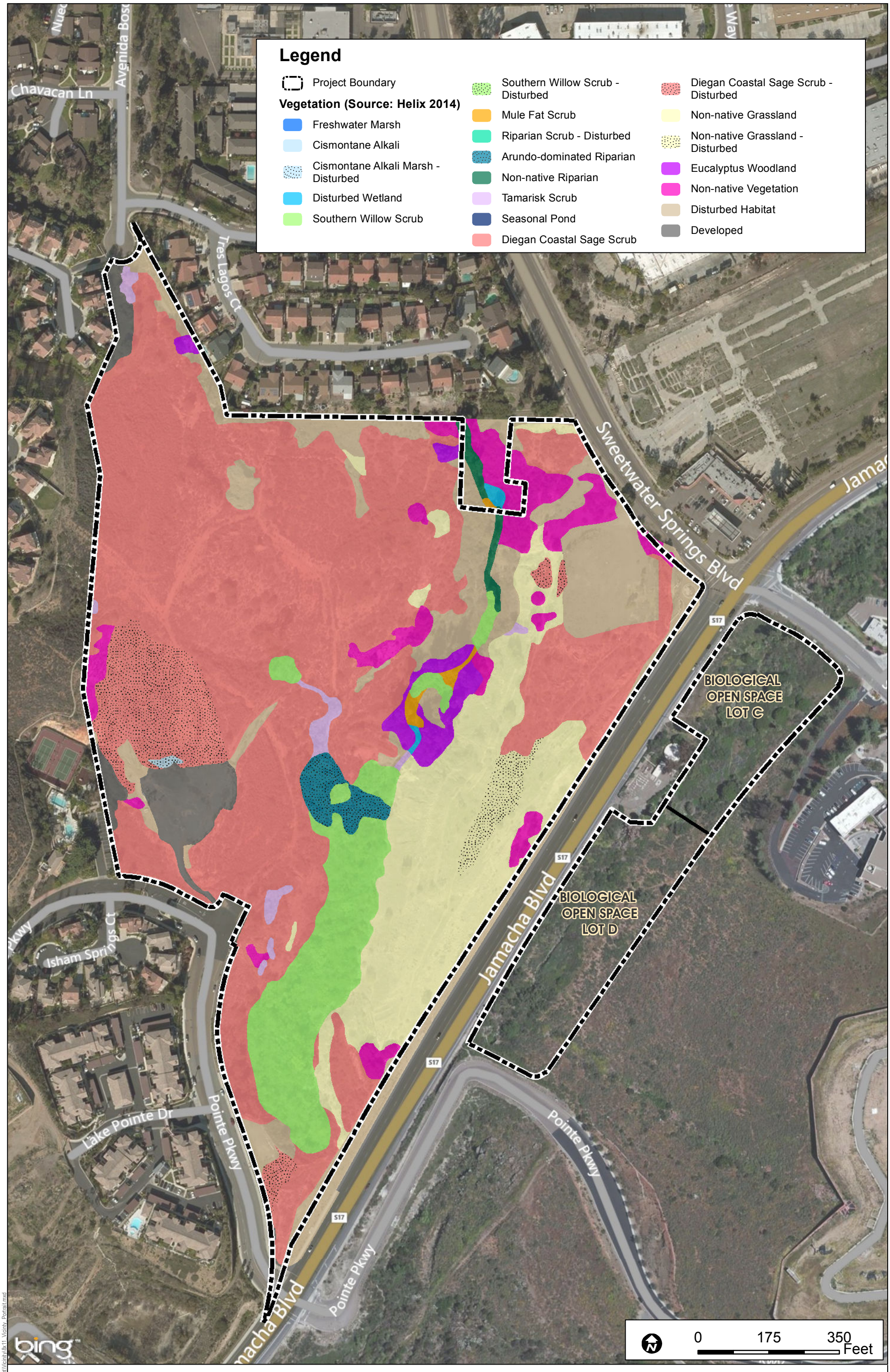
1.3.3 Vegetation

Vegetative fuels on site are characteristic of the area and are primarily non-native grassland, and Diegan coastal sage scrub, although smaller pockets of eucalyptus woodland, non-native riparian, freshwater and cismontane alkali marsh, disturbed wetland, and ornamental vegetation types are present. Disturbed habitat and urban/developed land cover types are also present on the site. The area proposed for development will be converted to roads, structures, and landscape vegetation following project completion. Any native vegetative fuels within fuel modification zones will be modified as a result of development, altering their current structure and species composition. Areas outside of proposed development and fuel modification zones will continue to be dominated by sage scrub fuels. The acreage of each on-site vegetation community or land cover type is provided in Table 1 and illustrated in Figure 3.

Table 1
On-Site Vegetation and Land Cover Types – The Sweetwater Vistas Project Site

Vegetation/Land Cover Type[1]	Acreage	Percent Coverage
Non-Native Communities and Land Covers		
Disturbed Habitat	9.2	17.6%
Eucalyptus Woodland	0.7	1.3%
Non-native grassland	3.6	6.9%
Non-native vegetation	3.0	5.7%
Urban/Developed	1.4	2.7%
Sage Scrub		
Diegan coastal sage scrub	27.6	52.9%
Riparian/Wetlands		
Arundo-dominated Riparian	0.49	0.94%
Cismontane Alkali Marsh	1.17	2.2%
Disturbed Wetland	0.10	0.19%
Freshwater Marsh	0.02	0.04%
Mulefat scrub	0.33	0.63%
Non-native Riparian	0.44	0.84%
Southern Willow Scrub	3.76	7.2%
Tamarisk Scrub	0.41	0.79%
Total	**52.0**	**100.00%**

Source: Helix Environmental Planning, Inc. 2015
Note: Upland habitats are rounded to the nearest 0.1 acre and wetland habitats are rounded to the nearest 0.01 acre.



SOURCE: Bing Maps 2014, Envicom 2015

DUDEK

FIGURE 3

Vegetation and Land Cover Map

Sweetwater Vistas Project - Fire Protection Plan

Z:\Templates\Arcmap\Current\Vicinity\8x11 Vicinity Portrait.mxd

INTENTIONALLY LEFT BLANK

1.3.4 Vegetation Dynamics

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

As described, vegetation plays a significant role in fire behavior, and is an important component to the fire behavior models discussed in this report. A critical factor to consider is the dynamic nature of vegetation communities. Fire presence and absence at varying cycles or regimes disrupts plant succession, setting plant communities to an earlier state where less fuel is present for a period of time as the plant community begins its succession again. In summary, high frequency fires tend to convert shrublands to grasslands or maintain grasslands, while fire exclusion tends to convert grasslands to shrublands, over time. In general, biomass and associated fuel loading will increase over time, assuming that disturbance (fire, grazing) or fuel reduction efforts are not diligently implemented. It is possible to alter successional pathways for varying plant communities through manual alteration. This concept is a key component in the overall establishment and maintenance of the proposed fuel modification zones on site. The fuel modification zones on this site will consist of irrigated and maintained landscapes as well as thinned native fuel zones that will be subject to regular "disturbance" in the form of maintenance and will not be allowed to accumulate excessive biomass over time, which results in reduced fire ignition, spread rates, and intensity.

Conditions adjacent the project's footprint (outside the fuel modification zones), where the wildfire threat will exist post-development, are classified as medium to heavy fuel loads due to the dominance of sage scrub or riparian forest fuels.

1.3.5 Climate

East San Diego County and the project area are influenced by the Pacific Ocean and are frequently under the influence of a seasonal, migratory subtropical high pressure cell known as

the "Pacific High" (WRCC 2014). Wet winters and dry summers with mild seasonal changes characterize the Southern California climate. This climate pattern is occasionally interrupted by extreme periods of hot weather, winter storms, or dry, easterly Santa Ana winds. The average high temperature for the project area during fire season is approximately 83°F, with temperature in summer and early fall months (July–October) reaching up to 102°F. Precipitation typically occurs between December and June with annual rainfall ranging from 3.5 to 13.3 inches (Water Years 2012 to 2014) with lower annual accumulation (3.5 to 5.2 inches) in 2015 due to the current drought (DWR 2015).

The prevailing wind pattern is from the west (on-shore), but the presence of the Pacific Ocean causes a diurnal wind pattern known as the land/sea breeze system. During the day, winds are from the west–southwest (sea) and at night winds are from the northeast (land), averaging 2 miles per hour (mph). During the summer season, the diurnal winds may average slightly higher (approximately 16 mph) than the winds during the winter season due to greater pressure gradient forces. Surface winds can also be influenced locally by topography and slope variations. The highest wind velocities are associated with downslope, canyon, and Santa Ana winds.

The project area's climate has a large influence on the fire risk as drying vegetation during the summer months becomes fuel available to advancing flames should an ignition be realized. Typically the highest fire danger is produced by the high-pressure systems that occur in the Great Basin, which result in the Santa Ana winds of Southern California. Sustained wind speeds recorded during recent major fires in San Diego County exceeded 30 mph and may exceed 50 mph during extreme conditions. The Santa Ana wind conditions are a reversal of the prevailing southwesterly winds that usually occur on a region-wide basis during late summer and early fall. Santa Ana winds are warm and dry winds that flow from the higher desert elevations in the north through the mountain passes and canyons. As they converge through the canyons, their velocities increase. Consequently, peak velocities are highest at the mouths of canyons and dissipate as they spread across valley floors. Santa Ana winds generally coincide with the regional drought period and the period of highest fire danger. The Sweetwater Vistas project site is affected by Santa Ana winds.

2 DETERMINATION OF PROJECT EFFECTS

FPPs provide an evaluation of the adverse environmental effects a proposed project may have from wildland fire. The FPP must provide mitigation for identified impacts to ensure that development projects do not unnecessarily expose people or structures to a significant loss, injury or death involving wildland fires. Significance is determined by answering the following guidelines:

Would the project expose people or structures to a significant risk of loss, injury or death involving wildland fires, including where wildlands are adjacent to urbanized areas or where residences are intermixed with wildlands?

The wildland fire risk in the vicinity of the Project site has been analyzed and it has been determined that wildfires may occur in wildland areas to the east and south of the project site as well as potentially in the preserved on-site fuels, but would not be significantly increased in frequency, duration, or size with the construction of the Project. In fact, the existing site includes numerous potential fire issues including numerous invasive/exotic trees and homeless campsites. The Project would include conversion of fuels to maintained urban development with designated landscaping and fuel modification areas. As such, the site will be largely converted from readily ignited fuels to ignition resistant structures and equipment.

The types of potential ignition sources that currently exist in the area include vehicle and roadway, a wildfire from the vast open space areas east of the proposed development and off-site residential neighborhoods. The project would introduce potential ignition sources, but would also include conversion of ignitable fuels to lower flammability landscape and include better access throughout the site, managed and maintained landscapes, more eyes and ears on the ground, and generally a reduction in the receptiveness of the areas landscape to ignition. Fires from off-site would not have continuous fuels across this site and would therefore be expected to burn around and/or over the site via spotting. Burning vegetation embers may land on Project structures, but are not likely to result in ignition based on ember decay rates and the types of non-combustible and ignition resistant materials that will be used on site.

The Project would comply with applicable fire and building codes and would include a layered fire protection system designed to current codes and inclusive of site-specific measures that will result in a Project that is less susceptible to wildfire than surrounding landscapes and that would facilitate fire fighter and medical aid response.

Would the project result in inadequate emergency access?

The Project includes fire access throughout the neighborhood and is consistent with the SMCFPD Ordinance 2013-1 and 2013 CFC. Fire access on the Project site will be improved from its current condition, which provides only limited access on dirt/gravel roads. Fire apparatus access throughout the development consists of residential streets with a width of 24 to 26 feet. Driveways that are adjacent to two story structures are a minimum of 26 feet in width. All proposed

three-story buildings will be accessible by an aerial fire apparatus from a 28-foot wide, main driveway. The project provides looped roadways or turnarounds meeting fire department requirements throughout Lots #1 through #3. Fire apparatus turnarounds to include turning radius of a minimum 28 feet, measured to inside edge of improved width, per SMCFPD standard. In addition, emergency access is provided at two main access roads (Jamacha and Sweetwater Springs Boulevards) with an additional access point at the northwest corner of the property off the existing cul-de-sac at Avenida Bosques. All emergency access roads will strategically enable faster access for responders from SMCFPD Fire Station 15, which is roughly one mile from this site. Roads will conform with surface, width, turning radius, and vertical clearance Code requirements for emergency access. Traffic calming features that have been pre-approved by the SMCFPD's Fire Marshal will be provided on Avendia Bosques pursuant to SMCFPD's design criteria as described in Section 5.1.1. Therefore, emergency access is considered adequate for this site.

Would the project result in substantial adverse physical impacts associated with the provision of new or physically altered governmental facilities, need for new or physically altered governmental facilities, the construction of which could cause significant environmental impacts, in order to maintain acceptable service ratios, response times or other performance service ratios, response times or other performance objectives for fire protection?

The Project is projected to add an estimated fewer than 53 calls per year to the SMCFPD's existing call load. This estimate is a conservative estimate in that it uses San Diego County wide data, which incorporates call volumes from typically higher volume areas than would be expected from this site. The primary response (first in) would be provided by Station 15. The addition of 53 calls/year (5 calls per month, roughly 1 call per week,) is considered insignificant and will not require the construction of additional Fire Station facilities based on that increase alone. Further, the fire station can respond to the entire project within the San Diego County General Plan 5 minute travel time requirement. Therefore, no additional facilities would be needed for response coverage. A portion of the project's parcel tax revenue will be allocated to fire protection, which can be used to maintain current levels of protection without impacting existing citizens.

Would the project have sufficient water supplies available to serve the project from existing entitlements and resources, or are new or expanded entitlements needed?

The project will be served by Otay Water District (OWD) and sufficient water supplies will be available to serve the project from existing entitlements and resources. SMCFPD, San Diego County Fire Authority, and OWD require new development to meet a minimum 2500 gpm fire flow. The pressures in the development will remain above 20 psi when meeting the fire requirements for the water district.

The measures described in the responses to these significance questions are provided more detail in the following sections.

3 ANTICIPATED FIRE BEHAVIOR

3.1 Fire History

Fire history is an important component of the FPP. Fire history data provides valuable information regarding fire spread, fire frequency, most vulnerable areas, and significant ignition sources, amongst others. In turn, this understanding of why fires occur in an area and how they typically spread can then be used for pre-planning and designing defensible communities. Based on a review of available historical fire perimeter data since 1911, portions of the project site has burned one time (Un-named Fire, 1945) since records have been documented (FRAP 2014)[1]. The 25 acre - Pointe Fire (August 17-18, 2016) in Spring Valley, north of Pointe Parkway and west of Jamacha Road is the most recent fire, which burned to within approximately 0.3 mile west of the project site. Facilitated by years of drought, steep terrain, and low relative humidity, the fire spread quickly burning on brush-covered hillsides. SMCFPD may have data regarding other smaller, undocumented fires that have occurred on the site that have not been included herein. The history of wildfires in the Project area is significant, and is graphically portrayed in the map in Appendix B. This map presents fire history before the Pointe Fire within five miles of the project site. Recorded fires that have burned in the vicinity of The Sweetwater Vistas site are listed in Table 2.

Table 2
Fire History within Five Miles of the Sweetwater Vistas Project Site

Fire Year*	Fire Name	Interval (years)	Total Area Burned (acres)
1911	Un-named	N/A	10,934
1913	Un-named	2	99
1926	Un-named	13	10,371
1942	Un-named	16	238
1943	Un-named	1	626
1944	Un-named	1	194
1945	Un-named	1	708
1950	Sequan #2/Wet Back	5	5,332 / 3,955
1953	Steele Canyon #2	3	534
1958	San Miguel	8	975
1968	Proctor	10	2,385
1969	Mother Miguel	1	305
1970	Laguna	1	174,121
1980	Trace/Proctor	10	57 / 2,300
1981	Assist #11/Proctor #1 & #2	1	261 / 456 / 72

[1] Based on polygon GIS data from CAL FIRE's Fire and Resource Assessment Program (FRAP), which includes data from CAL FIRE, USDA Forest Service Region 5, BLM, NPS, Contract Counties and other agencies. The data set is a comprehensive fire perimeter GIS layer for public and private lands throughout the state and covers fires 10 acres and greater between 1878–2014.

Table 2
Fire History within Five Miles of the Sweetwater Vistas Project Site

Fire Year*	Fire Name	Interval (years)	Total Area Burned (acres)
1984	Miller/Miguel/Proctor	3	43 / 64 / 3,032
1985	Miller	1	8,270
1986	Proctor	1	235
1989	Proctor #7/Proctor #7	3	400 / 86
1998	Jamacha	9	148
1999	Proctor	1	1,460
2003	Mine/Otay	4	44,734
2005	Summitt	1	6
2006	Proctor	1	9
2007	Harris 2	1	90,728

* **Source:** CALFIRE FRAP 2014

Based on an analysis of this fire history data set, specifically the years in which the fires burned, fire return intervals range between 1 to 16 years, indicating significant wildfire potential in the region. Based on fire history, the project site is subject to occasional wildfires associated primarily with a Santa Ana wind-driven wildfire burning or spotting onto the site most likely from the east in native fuels.

3.2 Fire Behavior Modeling

Following field data collection efforts and available data analysis, fire behavior modeling was conducted to document the type and intensity of fire that would be expected on this site given characteristic site features such as topography, vegetation, and weather. Results are provided below and in Figure 4 and a more detailed presentation of the modeling inputs and results is provided in Appendix C.

3.2.1 Fuel Model Output Results

An analysis utilizing the BehavePlus software package was conducted to evaluate fire behavior variables. Utilizing the dominant on-site vegetation types [Coastal sage scrub (Fuel Model SCAL 18), Moderate Load Chaparral (Fuel Model sh2), and riparian forest (Fuel Model 9)], slope values for the site (5% to 35% slope), and the Peak and Summer wind and fuel moisture values, fire behavior calculations were conducted, with the results presented in Table 3.

Table 3
BehavePlus Fire Behavior Modeling Results

Model Run	Fuel Model(s)	Flame Length (feet)	Fireline Intensity (Btu/ft/s)	Surface Rate of Spread (mph)
1	SCAL 18	39.3 to 44.2 (48.4)*	16,549 to 21.382 (26,123)*	2.59 to 3.35 (4.09)*
2	9, sh2	3.2 to 8.5	70 to 599	< 1.0
3	SCAL 18	19.9 to 26.5	3,775 to 7053	0.65 to 1.21
4	9, sh2	7.9 to 18.2 (11.7 to 21.0)*	504 to 3,117 (1,195 to 4,237)*	0.7 to 1.37 (1.67 to 1.86)*

Note:
* Parentheses represents modeling results for 50 mph wind gusts

The majority of the site and adjacent areas were modeled as a Fuel Model SCAL18. The narrow drainage of riparian forest in the central portion of the project site (Model Runs 2 and 4) were modeled as a Fuel Model 9 with small patches of chaparral intermixed with the riparian habitat were modeled as a Fuel Model Sh2. It should also be noted that the hillsides on the western portion of Planning Area B site slope upward, away from the development, which affects fire spread rates and results in a slower, less aggressive fire that "backs" down the hillside, under typical conditions.

Fires in sage scrub fuels are expected to move faster than those in riparian habitat and will also produce significantly higher intensities and flame lengths. As presented Table 3, wildfire behavior in non-treated coastal sage scrub, presented as a SCAL 18, varies based on timing of fire. A worst case summer fire (Summer condition) would result in a fire spreading at a rate of up to 1.2 miles per hour (mph) with flame lengths reaching to 21 feet. During a fall fire with gusty Santa Ana (Peak condition) winds and low fuel moisture, fire is expected to be fast moving at up to 4.1 mph with highest flame length values reaching approximately 48 feet in specific portions of the property. Fires burning into brush thinning zones of the proposed Fuel Modification Zones are expected to be less intense and generate lower flame lengths.

The results presented in Table 3 depict values based on inputs to the BehavePlus software and are not intended to capture changing fire behavior as it moves across a landscape. Changes in slope, weather, or pockets of different fuel types are not accounted for in this analysis. For planning purposes, the averaged worst-case fire behavior is the most useful information for conservative fuel modification design. Model results should be used as a basis for planning only, as actual fire behavior for a given location will be affected by many factors, including unique weather patterns, small-scale topographic variations, or changing vegetation patterns.

3.3 On-Site Risk Assessment

Although a large wildfire has not occurred since 1945 on The Sweetwater Vistas property, the site would, under favorable weather conditions, facilitate wildfire spread, especially given the vegetation and topographical characteristics of the area, along with the off-site wildland fuels to the east. The most common type of fire anticipated in the vicinity of the project area is a wind-driven fire from the northeast during the fall that begins east of the project site.

The proposed The Sweetwater Vistas project is situated in an area that, due to its moderately steep terrain, sage brush fuels, adjacent ignition sources, and fire history, is subject to periodic wildfire. Wildland fires are a common natural hazard in most of southern California with a long and extensive history. Southern California landscapes include a diverse range of plant communities, including vast tracts of shrublands, like those found on and adjacent to The Sweetwater Vistas site. Wildfire in this Mediterranean-type ecosystem ultimately affects the structure and functions of vegetation communities (Keeley 1984) and will continue to have a substantial and recurring role (Keeley and Fotheringham 2003). Supporting this are the facts that 1) native landscapes, from forest to grasslands, become highly flammable each fall and 2) the climate of southern California has been characterized by fire climatologists as the worst fire climate in the United States (Keeley 2004) with high winds (Santa Ana) occurring during autumn after a six-month drought period each year. Based on this research, the anticipated growing population of east County WUI areas, and the regions fire history, it can be anticipated that large wildfires will occur near the project area, with the vast expanses of wildland fuels east of Jamacho Mountains, and surrounding communities, being no exception.

Therefore, it will be critical that the latest fire protection technologies, developed through intensive research and real world wildfire observations and findings by fire professionals, for both ignition resistant construction and for creating defensible space in the ever-expanding WUI areas, are implemented and enforced. The Sweetwater Vistas project will implement the latest fire protection measures as well as exceed standard requirements for fuel modification.

Z:\Templates\Arcmap\Current\Vicinity\8x11_Vicinity_Portrait.mxd

SOURCE: FUSCOE ENGINEERING 2016

DUDEK

FIGURE 4
Fire Behave Plus Analysis Map

Sweetwater Vistas Project - Fire Protection Plan

INTENTIONALLY LEFT BLANK

4 ANALYSIS OF PROJECT EFFECTS

4.1 Field Assessment

Dudek conducted a field assessment of the Project site on February 26, 2015, in order to confirm/acquire site information, document existing site conditions, and to determine potential actions for addressing the protection of the project's structures. While on site, Dudek assessed the area's topography, natural vegetation and fuel loading, surrounding land use and general susceptibility to wildfire. Among the field tasks that were completed are:

- Vegetation estimates and mapping refinements
- Fuel load analysis
- Topographic features documentation
- Photograph documentation
- Confirmation/verification of hazard assumptions
- Ingress/egress documentation.

4.2 Adequate Emergency Services

4.2.1 Emergency Response and Service

4.2.1.1 Emergency Response

The project site is located within SMCFPD. The Fire District has entered into a cooperative fire services agreement with CAL FIRE for dispatch and fire suppression services. Table 4 presents a summary of the location, equipment, staffing levels, maximum travel distance, and travel time for the two, closest SMCFPD stations responding to the Sweetwater Vistas Project Site. Travel distances are derived from Google road data while travel times are calculated applying the nationally recognized Insurance Services Office (ISO) Public Protection Classification Program's Response Time Standard formula (T=0.65 + 1.7 D, where T= time and D = distance). The ISO response travel time formula discounts speed for intersections, vehicle deceleration and acceleration, and does not include turnout time.

Table 4
SMCFPD Responding Stations Summary

Station	Location	Equipment	Staffing	Maximum Travel Distance*	Travel Time**
Station 15/65***	2850 Via Orange Way, Spring Valley California 91978	Type 1Paramedic Engine Ladder Truck Type 3 Engine Paramedic Ambulance Heavy Rescue Engine Light & Air Support Unit B.C. Staff vehicle	On duty : 3 firefighters per shift plus 2 -3rd party ambulance crew	0.98 miles	2.0 min.19 sec.
Station 16/66	905 Gillespie Drive, Spring Valley, California 91977	Type 1 Paramedic Engine Brush Engine	On-duty: 3 per shift	2.6 mi.	5 min.7 sec.

* Distance measured to the southwest corner of the project site on Pointe Parkway.
** Assumes travel to the project entrance on Pointe Parkway, a 35 mph travel speed, and does not include turnout time
*** Fire station numbers 15/65 represent the SMCFPD station number then the CALFIRE station number.

Based on The Sweetwater Vistas site location in relation to existing SMCFPD stations, travel time to the site for the first responding engine from Station 15 is approximately 2 minutes to the project entrance at the southwest end of the project site on Pointe Parkway. Travel within the development is less than 1.0 minute, based on the longest proposed road stretch of approximately 0.18 miles, resulting in response time of less than 3.0 minutes to the most northwestern portion of the development. Secondary response from station 16 would arrive in 5.5 minutes. All response calculations are based on an average response speed of 35 mph, consistent with nationally recognized NFPA 1710. Based on these calculations, emergencies within the project can be responded to by first responding engine in accordance with the San Diego County's General Plan 5 minute response time goal for urban areas.

In addition, SMCFPD participates as a member of the Central Zone with their surrounding jurisdictions. Members of the Central Zone utilize common operational policies and have automatic and mutual aid agreements in place to provide the most efficient level of service possible.

4.2.1.2 Emergency Service Level

The SMCFPD estimates 11,238 total annual calls (SMCFPD 2015a) within the Fire District and a District population of approximately 134,000 (SMCFPD 2015b). The per capita call volume is roughly 8.4 for the Fire District, or 84 calls per 1,000 persons per year. The San Diego County average is approximately 82 calls per 1,000 persons per year. Based on the proposed development plans, the project's estimated 630 residents (assumes an average of 2.89 occupants per residence for this type of community (SANDAG 2014)) and using the Fire District's 84 calls

per 1,000 number would generate roughly 53 calls per year (less than 5 calls per month), most of which are expected to be medical-related calls.

Service level requirements are not expected to be significantly impacted with the increase of approximately 53 calls per year (roughly 1 call per week). Therefore, the project is not expected to cause a decline in overall SMCFPD response times. The requirements described in this FPP are intended to aid firefighting personnel and minimize the demand placed on the existing emergency service system.

4.2.2 Cumulative Impacts on Fire Response

Cumulative impacts from multiple projects can cause fire response service decline and must be analyzed for each project. The Sweetwater Vistas project and its proposed usage by up to 630 residents represents an increase in potential service demand of approximately 53 calls per year, well within the capacity of the existing Fire Stations that will service the project. However, this total adds to an existing busy service obligation for Station 15 and, when considered cumulatively, the impact is considered potentially significant, but mitigated to less than significant through the project's fire safety features and increased funding available to the SMCFPD through property taxes and other fees that can be used for providing resource enhancements.

INTENTIONALLY LEFT BLANK

5 FIRE SAFETY REQUIREMENTS – INFRASTRUCTURE, BUILDING IGNITION RESISTANCE, AND DEFENSIBLE SPACE

The 2014 Consolidated Fire Code and the San Miguel Consolidated Fire Protection District's Ordinance Number 2013-1 govern the building, infrastructure, and defensible space requirements detailed in this FPP. The proposed project addresses the Fire District's list of conditions of approval for Project Service Availability Letter (Appendix E). Additionally, it will meet applicable codes and will provide alternative materials and/or methods, if warranted. The following summaries highlight important fire protection features. All underground utilities hydrants, and water mains will be installed and the drive surface shall be approved prior to combustibles being brought on site.

5.1 Roads

5.1.1 Access

Site access will comply with the requirements of the SDCCFC and SMCFPD (Sections 503.1 and 503.2). Lots #1 and #2 would be accessed from a 40 feet wide publically maintained road (Avenida Bosques), which intersects with Pointe Parkway and Jamacha Boulevard. An additional access point to Lots #1 and #2 is at the northwest corner of the property off the existing cul-de-sac on Avenida Bosques. The driveway entrance to Lot #3 would be located off of Sweetwater Springs Boulevard. On-site private roadways would be constructed within Lot s #1 through #3 where development would occur.

Two Traffic calming features, including roundabouts and traffic signage, are proposed on Avenida Bosques between Pointe Parkway and the existing cul-de-sac at the northwest corner of the property. Additionally, existing emergency access driveway connecting Avenida Bosques with adjacent residential community via California Waters Drive will be realigned. Figure 5 displays the locations of the proposed traffic calming features and driveway realignment. Traffic calming features have been designed to be fully traversable and strategically placed to enable emergency vehicle response with unimpeded travel.

Similarly, speed humps, if used elsewhere in the development, will be designed and approved by SMCFPD[2] with the following dimensions.

1. Begin speed humps at the edge of the gutter or if no gutter exists, the speed humps will begin one foot from the curb face.
2. Dual tires on the rear axle of a fire apparatus require a minimum 24 inches for each side and 48 inches separating both tire openings.

[2] Pursuant to e-mail correspondence with Tony Morgan, SMFPD Deputy Fire Marshal, on December 15, 2015.

3. The distance from the outer edge of the tire openings shall span 96 inches.

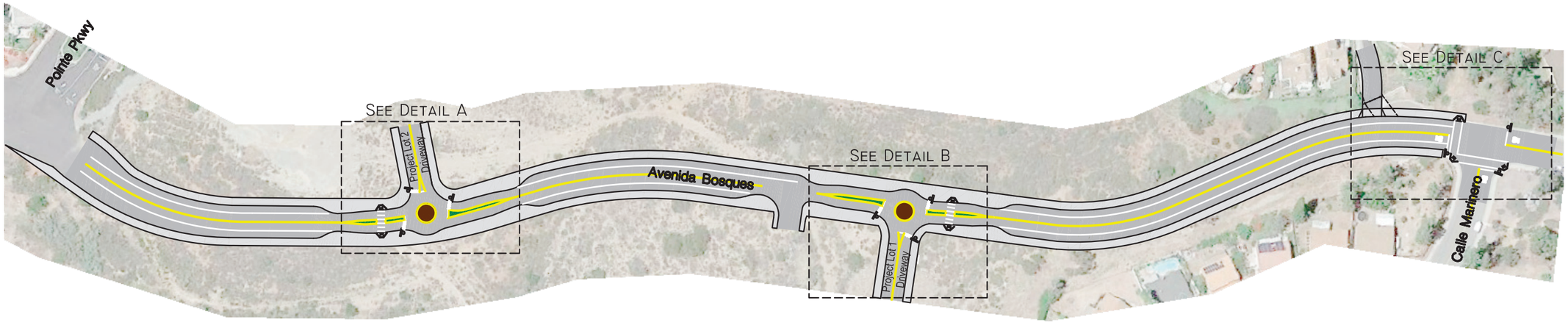
5.1.2 Road Widths and Circulation

- All on-site roads will be constructed to current SDCCFC and SMCFPD Road standards, including minimum 24-foot road widths unobstructed by parking (503.2.1), and shall be improved with asphalt paving materials that support the imposed loads of fire apparatus (not less than 75,000 lbs.).
- Roadways will primarily consist of residential streets with a width of 24 to 26 feet that generally traverse within a planning area and 20- to 22-foot wide private motor court driveways that typically end within 150 feet of a 26-foot wide street. The driveways adjacent to two story structures are a minimum of 26 feet in width, except for a small segment less than 175 feet in length at the northeast corner of Lot#3, which is 24 feet wide with two story structures only on the east side of the street. All proposed three-story buildings will be accessible by an aerial fire apparatus from a 28-foot wide, main driveway. The Site Fire Safety Plan (Figure 6) illustrates the road width dimensions.

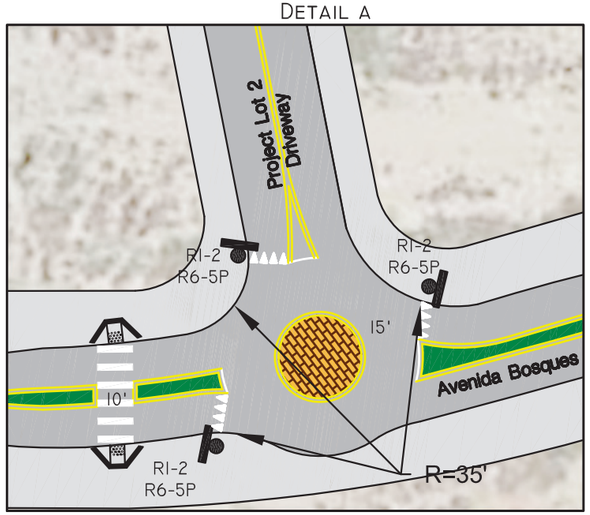
All residential parking will be designated parking stalls within the Lots #1, #2, and #3. Parking will be restricted along the primary interior access road for Lots #1 and #2 by posting of signs stating "No Parking- Fire Lane CVC (California Vehicle Code) 22500.1" to preserve the unobstructed width for emergency response. Signs that are legally enforceable shall be posted at each entrance gate and throughout the property. Signs shall be securely mounted facing the direction towards oncoming traffic entering the area and clearly visible indicating that "violating vehicles will be towed at owner's expense." Prior to a final fire inspection for the proposed development, a written agreement for services with a towing company per CVC 22658(a) will be in place.

5.1.3 Maximum Dead-End Road Length

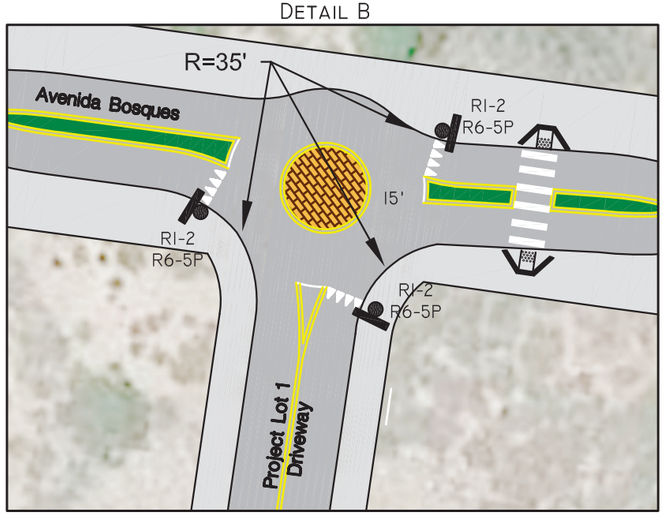
The project provides looped roadways or turnarounds throughout each Planning Area. There will be no dead end road lengths that are considered unacceptable by the SMCFPD and SDCCFC 800-foot limit.



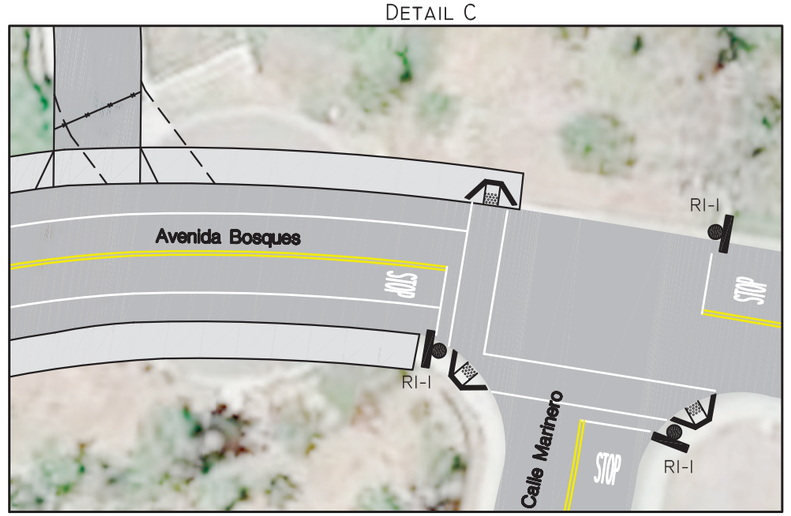
Detail A



Detail B



Detail C



LEGEND

- 55' Inscribed Diameter Mini Roundabout (Fully Traversible for Emergency Vehicles)
- Traffic Sign
- Existing Gated Access
- Existing Driveway to be Realigned

Signs

RI-1 RI-2 R6-5P

Note: This drawing represents a conceptual design. Final design may vary.

NORTH

1" : 200'

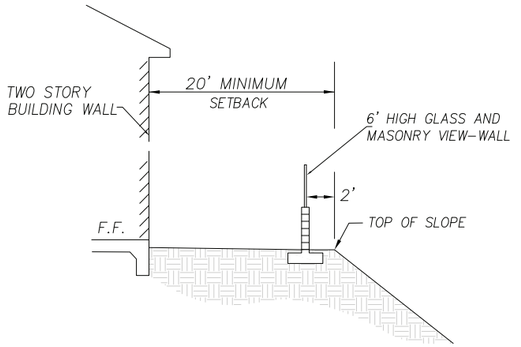
SOURCE: LINSCOTT LAW & GREENSPAN 2016

DUDEK

FIGURE 5

Avenida Bosques Traffic Calming Features

INTENTIONALLY LEFT BLANK



TYPICAL SECTION: NON-COMBUSTIBLE VIEW-WALL

NO SCALE

LEGEND

- 20' BUFFER
- 30' BUFFER
- NON-COMBUSTIBLE VIEW-WALL LOCATIONS
- EXISTING FIRE HYDRANT (FH)
- PROPOSED FIRE HYDRANT FH
- PROPOSED RETAINING WALL
- PROPOSED WATER QUALITY BASIN

SOURCE: FUSCOE ENGINEERING 2016

DUDEK

FIGURE 6
Site Fire Safety Plan

INTENTIONALLY LEFT BLANK

5.1.4 Interior Circulation Roads

- Interior circulation roads include all roadways that are considered common or primary roadways for traffic flow through the site and for fire department access and serving in excess of two structures. Any dead-end roads serving new buildings that are longer than 150 feet shall have approved provisions for fire apparatus turnaround.
- Fire apparatus turnarounds to include turning radius of a minimum 28 feet, measured to inside edge of improved width, per SMCFPD standard.
- Roadways and/or driveways shall provide fire department access to within 150 feet of all portions of the exterior walls of the first floor of the structures (all structures are fire sprinklered)
- Vertical clearance of vegetation along roadways is required to be 13 feet 6 inches. Proper maintenance is required to ensure that vegetation and trees on roadsides do not grow over or into the roadway and impede emergency apparatus access. No mature tree trunks shall intrude into the road. The type of vegetation shall be fire resistant and comply with this plan.
- Existing interior circulation roads shall maintain a 20 feet buffer along either side where fuel modification/reduction is completed on an annual basis according to specifications provided in this FPP.
- Angle of approach/departure shall not exceed 7 degrees (12%) (Section 503.2.7), unless mitigated to approval by the Fire Chief.
- Road grades will not exceed 15%, unless mitigated to approval by the Fire Chief (maximum 20%).
- A response map update in a format compatible with current department mapping shall be provided to the SMCFPD (Section 505.5).

5.2 Gates

Lot #3 will have a gated entry off of Sweetwater Springs Boulevard. This gate will be designed according to the County of San Diego Department of Public Works (DPW) Design Standards (DS-17, 18, or 19), if applicable. Electric gates on private and public streets will comply with SMCFPD Ordinance 2013-1, Section 503.6and will include a Knox key-operated switch and strobe sensor for emergency access. Gates shall also be a minimum of 30 feet from the nearest edge of the roadway per SMCFPD Ordinance 2013-1, Section 503.6. Gates shall have a 24-foot clear horizontal width and a 13 feet 6 inches unobstructed vertical clearance. No gate is proposed on Avenida Bosque.

5.3 Identification

Identification of roads and structures will comply with County DPW Design Standard #DS-13 (public roads) and Sections 503.3 and 505 of SMCFPD Ordinance 2013-1, as follows:

- All structures shall be identified by street address. Numbers shall be 4 inches in height, 1/2 -inch stroke, and located 6 to 8 feet above grade. Addresses on multi-residential buildings shall be 6 inches high with 1/2-inch stroke. Numbers will contrast with background.
- Multiple structures located off common driveways will include posting structure identification on structures, on the entrance to individual driveways, and at the entrance to the common driveway.
- If the structure is 100 feet from the roadway, structure identification should also be located at the entrance to the driveway.
- Access roads to construction areas shall be completed and paved prior to issuance of building permits and prior to combustible construction occurring.

Illuminated directory maps will be installed at driveway entrances to all multi-family residential developments; i.e., Lots #1 through #3 (SMCFPD Local Ordinance Section 505.4). Final location of directory maps and content shall be approved by the Fire District.

5.4 Structures

5.4.1 Ignition-Resistant Structural Requirements

This section outlines ignition-resistant construction (for all structures) that will meet the requirements of the SMCFPD and SDCCFC. The following construction practices respond to the requirements of the Consolidated Fire Code, Section 4905 and the County Building Code (Chapter 7A), "Construction Methods for Exterior Wildfire Exposure" These requirements include the ignition resistant requirements found in Chapter 7A of the County Building Code. While these standards will provide a high level of protection to structures in this development, and should reduce or eliminate the need to order evacuations, there is no guarantee of assurance that compliance with these standards will prevent damage or destruction of structures by fire in all cases.

All new structures will be constructed to SMCFPD and San Diego County standards. Each of the proposed buildings will comply with the enhanced ignition-resistant construction standards of the latest California Building Code (Chapter 7A). These requirements address roofs, eaves, exterior walls, vents, appendages, windows, and doors and result in hardened structures that have been

proven to perform at high levels (resist ignition) during the typically short duration of exposure to burning vegetation from wildfires.

5.5 Fire Protection Systems

5.5.1 Water

The Project will be served by the Otay Water District (OWD). OWD has committed to deliver water to the Project as stated in Appendix F, County of San Diego's Project Facility Commitment - Water Form. All water storage and hydrant locations, mains and water pressures will be designed to fully comply with San Diego County Fire Code Fire Flow Requirements and the Fire Flow Requirements of the SMCFPD Ordinance 2013-1. Water supply must meet a 2-hour fire flow requirement of 2500 g.p.m. with 20-psi residual pressure, which must be over and above the daily maximum water requirements for this development. Water delivery systems are proposed as follows:

1. A 10-inch main in Avenida Bosque will connect to existing public mains at the north and south ends of the street.
2. Two 8-inch connections will serve a loop within Lot #1. This loop will serve fire hydrants within the lot, and a service connection to each multi-unit building.
3. An 8-inch connection will serve Lot #2 passing through the lot and connecting to the existing main in Pointe Parkway, adjacent to the south. On-site fire hydrants and service connections to each multi-unit building will be tapped from this proposed -inch main.
4. An 8-inch connection to the existing main in Sweetwater Springs Blvd. will serve Lot #3 passing through the lot and connecting to the existing main in Jamacha Blvd. On- site fire hydrants and service connections to each multi-unit building will be tapped from this proposed 8-inch main.

5.5.1.1 Fire Hydrants

- Hydrants shall be located along fire access roadways as determined by the SMCFPD Deputy Fire Marshal and SDCFA fire code officials to meet operational needs, at the beginning radius of cul-de-sac streets and every 300 feet apart for multi-family buildings. Proposed fire hydrant locations are shown on Figure 6- Site Fire Safety Plan.
- Hydrants shall have two 2-1/2-inch and one 4-inch National Standard Thread (NST) outlets and be of bronze construction per the County/District Fire Code. Prior to issuance of building permits, the appropriate number of fire hydrants and their specific locations, approved by the County or SMCFPD Deputy Fire Marshal, will be identified and they will be constructed accordingly.

- Prior to the issuance of building permits, the applicant shall submit to SMCFPD and the County plans demonstrating a water system capable of handling the fire flow requirements.
- Fire service laterals, valves, and meters will be installed on site as required by SMCFPD and SDCFA. Underground shall comply with NFPA 24 Installation of Private Fire Service Mains and their Appurtenances.
- Curbs shall be painted OSHA safety red and stenciled with "NO PARKING – FIRE LANE" adjacent to each fire hydrant.
- Reflective blue dot hydrant markers shall be installed in the street to indicate location of the hydrant.
- Crash posts will be provided where needed in on-site areas where vehicles could strike fire hydrants or fire department connections.

5.5.1.2 Automatic Fire Sprinkler Systems

All structures, of any occupancy type, will be protected by an automatic, interior fire sprinkler system. Fire sprinklers systems shall be in accordance with SMCFPD, SDFCA, and National Fire Protection Association (NFPA) Standards 13 or 13R, depending on the occupancy types in the structure. A Knox box with key shall be provided at each fire sprinkler riser room. All fire sprinkler riser rooms shall be clearly marked in accordance with NFPA 13. Fire sprinkler and monitoring plans for each structure will be submitted to SMCFPD for approval before installation.

Sprinkler System Supervision and Alarms

All valves controlling the water supply for automatic sprinkler systems, pumps, tanks, water levels and temperatures, critical air pressures and water-flow switches on all sprinkler systems shall be electronically supervised by a listed fire alarm system.

- **Exception:** Automatic sprinkler systems installed in accordance with NFPA 13R where a common supply main is used to supply both domestic water and the automatic sprinkler system and a separate shutoff valve for the automatic sprinkler system is not provided.

5.5.2 Fire Alarm Systems

All residential units shall have electric-powered, hard-wired smoke detectors and fire alarm systems in compliance with SMCFPD Ordinance 2013-1, 2013 CFC, and NFPA 72: National Fire Alarm and Signaling Code.

5.5.3 Structure Setback Requirements

SMCFPD has adopted setback standards from adjacent slopes (Ordinance 2013-1, Section 4907.1.3.). Structure setback from top of slope is based on structure height. A single story structure (12 feet plate height) requires a minimum 15 feet horizontal setback from top of slope to the farthest projection from the roof. A two- story structure requires a minimum of 30 feet of horizontal setback from top of slope to the farthest projection from a roof. These setbacks are typically calculated using a 30% slope factor. When buildings are set back from slopes, flames spreading up those slopes are deflected vertically and over the structure where cooling occurs, reducing the effects of convective heat on the structure. The majority of the residential units do not require a structure setback as previously-defined. However, some two-story residential units in Lots #1 and #3, which are adjacent to open space in Hansen Creek, are constrained to 15 to 20-foot setbacks from top of slope (See Figure 6). As an alternative to redesigning the project, as well as augmenting the FMZ on the slopes, allowance for two story structures will be provided with placement of a non-combustible, eight-foot-high view wall near the top of slope to provide additional upward heat deflection. In addition, dual pane, both panes tempered windows will be placed on the exposed side(s) of buildings with 15 to 20 feet setback from top of slope. Building setbacks will not be less than 15 feet in width. Additional fire protection features are detailed below in Chapter 6.

5.6 Defensible Space and Vegetation Management

5.6.1 Fuel Modification

The Sweetwater Vistas project will be exposed to naturally-vegetated biological open space areas to the west, east, and central portion of the Project Area. The Sweetwater Vistas project could also be considered an infill project surrounded by single-family type residential land uses on three sides (north, southwest, and northeast) and commercial retail on the east side. FMZs will be provided for those portions of the proposed development that are adjacent to open space areas. FMZs will include at least 100 feet, and in some areas are wider than the standard, from the structure outwards towards undeveloped areas.

The FMZ map is presented graphically for the Sweetwater Vistas project in Appendix D. The 100-foot FMZ will typically consist of a 50-foot-wide irrigated zone (Zone 1) and a 50-foot wide brush thinning zone (Zone 2). Some portions of the FMZ along the southeast side of a lot #1 will receive extended Zone 1 up to 227 feet on the manufactured slope facing the open space area. Fuel modification zones are designed to gradually reduce fire intensity and flame lengths from advancing fire by strategically placing thinning zones, restricted vegetation zones, and irrigated zones adjacent to each other on the perimeter of the WUI exposed structures. Because this site will utilize ignition resistant construction techniques and materials, the proposed fuel

modification areas will provide adequate set back from naturally occurring fuels under typical, fire weather conditions.

5.6.1.1 Fuel Modification Zone Requirements

FMZs will be implemented according to the following requirements for the entire Project, except as noted. To ensure long-term identification and maintenance, a fuel modification area shall be identified by a permanent zone marker meeting the approval of SMCFPD. All markers will be located along the perimeter of the fuel modification area at a minimum of 500 feet apart or at any direction change of the fuel modification zone boundary. Fuel Modification Zones will be maintained on at least an annual basis or more often as needed to maintain the fuel modification zone function.

Zone 1 – Irrigated Zone (0–50 feet wide)

Zone 1 is applicable site wide for every perimeter structure within each lot. The standard Zone 1 will be 50 feet wide starting from the structure for the perimeter structures and moving outward. All highly flammable native vegetation shall be removed except for species approved by the SMCFPD. This zone will be planted with drought-tolerant, less flammable plants from the proposed Project Sweetwater Vistas Plant Palette (Appendix G), which was prepared by GMP Landscape Architecture and Planning. Palm trees are not allowed within Zone 1. A permanent, automatic irrigation system will be installed in Zone 1 to maintain hydrated plants.

Zone 1 includes the following key components:

1. All trees shall be planted and maintained at a minimum of 10 feet from the tree's drip line to any combustible structure or chimney, including outdoor fireplaces.
2. Limit planting of large unbroken masses especially trees and large shrubs. Groupings should be 2–3 trees maximum, with mature foliage of any group separated horizontally by at least 10 feet or as presented in Table 5.
    - **Exception:** Lot #2 features a tall, hedge planting, not to exceed 12 feet in height, along the southwest border of the lot for screening the adjacent property's tennis courts, parking lot and structures. Shrubs will be planted in a staggered, layered massing between the property's boundary and townhomes for Lot #2. These shrubs will be in an irrigated zone (Zone 1) and will be pruned as needed to remove dead branches or foliage as well as declining or dead shrubs. Maintaining and hydrating the hedge plantings reduces the readily ignitable fuels and dramatically decreases the risk of ignition.

3. Mature trees shall be limbed to eight feet or 3x the height of understory plants, whichever is greater, to prevent ladder fuels[3].
4. No portable fire pits, or fire places, or flame generating devices that burn wood are allowed within Zone 1 or within 25 feet of native vegetation.
5. Shrub species that naturally grow to heights that exceed 2-3 feet shall be vertically pruned to prevent ladder fuels into the canopies of mature trees.
6. Grasses and weeds shall be cut to 6 inches in height. Native grasses can be cut after going to seed.
7. Combustible ground covers, such as mulch or wood chips, are prohibited against structures with an exterior stucco wall and weep screed. Ground covers within first three feet from structure are restricted to non-flammable materials, including stone, rock, concrete, bare soil, or other non-combustible material.

Zone 2 – Thinning Zone (51 to 100 feet from structures)

A thinning zone reduces the fuel load of a wildland area adjacent to Zone 1, and thereby, reduces heat and ember production from wildland fires, slows fire spread, and reduces fire intensity. Zone 2 measures up to 50 feet in width from Zone 1 for this project.

Zone 2 includes the following key components, if thinning of native vegetation is required:

1. Zone 2 requires a minimum of 50% thinning or removal of plants (50% no fuel) focusing on removal of dead and dying plants and highly flammable species.
2. Fuel continuity should be interrupted so that groupings of shrubs are separated from adjacent groupings.
3. Maintenance including ongoing removal and thinning of dead/dying planting, and regular trimming to prevent ladder fuels.
4. Trees and tree-form shrub species that naturally grow to heights that exceed 4 feet shall be vertically pruned to prevent ladder fuels.
5. Grasses shall be cut to 6 inches in height. Native grasses can be cut after going to seed.
6. Single specimen native shrubs, exclusive of chamise and sages, may be retained, on 20-foot centers.
7. No vegetation found on the Prohibited Plant List (Appendix H) shall remain in Zone 2.

[3] Plant material that can carry a fire burning in low-growing vegetation to taller vegetation is called ladder fuel. Examples of ladder fuels include low-lying tree branches and shrubs, climbing vines, and tree-form shrubs underneath the canopy of a large tree.

5.6.2 Other Vegetation Management

Roadway-Adjacent Defensible Space

As required under SMCFPD Fire Code, an area of 20 feet from each side of Avenida Bosques and the side facing the open space area along Jamacha Boulevard and Pointe Parkway shall be improved and maintained to Zones 1 or Zone 2 standards. This area shall be maintained by the HOA or another approved entity. Vertical clearance of 13.5 feet shall also be maintained along these apparatus access roads.

Community Development Landscapes

The following requirements are provided for landscapes within the interior portions of the developed lots.

1. Plants used in the interior landscapes will include drought-tolerant, fire resistive trees, shrubs, and groundcovers. The plantings will be consistent with the proposed Sweetwater Vistas Plant Palette (Appendix G). The intent of the list is to provide examples of plants that are less prone to ignite or spread flames to other vegetation and combustible structures during a wildfire. Additional plants can be added to the landscape plant material palette by a licensed urban forester or Landscape Architect familiar with firewise landscaping[4]. All landscaping shall be maintained by the HOA or another approved entity.
2. Throughout the project site, high-density product types, such as townhome clusters, with a full NFPA 13R fire protection sprinkler system can include planting of trees and climbing vines adjacent to or near the structure as long as the exterior side of the building is not in Zone 1.
3. Additionally, palm trees outside of Zone 1 that have fibrous tissue or leaf stem bases along the trunk shall be planted and maintained no closer than 30 feet from the trees drip line to any combustible structure. Some examples of tree species with fibrous tissue are *Chamaerops humilis* (Mediterranean Fan Palm), *Phoenix canariensis* (Canary Island Date Palm), *P. dactylifera* (Date Palm), *P. reclinata* (Senegal Date Palm), *P. roebelenii* (Pygmy Date Palm), and *Trachycarpus fortunei* (Windmill Palm). The *Washingtonia robusta* (Mexican Fan Palm) and *W. filifera* (California Fan Palm) are examples of palm trees with leaf bases. Palm tree maintenance includes removing dead palm fronds and cleaning (i.e., skinning) palm trunks of fibrous tissue or leaf bases as needed to eliminate the presence of ember catching palm trunks.

[4] Landscape with low fuel volume and less flammable plants. Webpage links for firewise landscaping at www.firewise.org or www.fireadapted.org.

- **Exception:** Properly skinned palms may be allowed to be planted no closer than 10 feet from the palm's drip line to structure, if the palms listed above are planted within recreation centers that are adjacent to non-residential buildings and they do not occur within Zone 1.

Special Fuel Management Issues

Trees may be planted within FMZs as long as they conform to the County's Consolidated Fire Code, Section 4907.3.Trees (SMCFPD has adopted the County standard). On the Project site, tree planting in the fuel modification zones and along roadways is acceptable, as long as they meet the following restrictions as described below and in the Vegetation Management Section:

- For streetscape plantings, fire resistive trees can be planted 10 feet from edge of curb to center of tree trunk. Care should be given to the type of tree selected, that it will not encroach into the roadway, or produce a closed canopy effect.
- Crowns of trees located within defensible space shall maintain a minimum horizontal clearance of 10 feet for fire resistant trees. Mature trees shall be pruned to remove limbs one-third the height or 8 feet, whichever is greater, above the ground surface adjacent to the trees.
- Dead wood and litter shall be regularly removed from trees.
- Ornamental trees shall be limited to groupings of 2–3 trees with canopies for each grouping separated horizontally as described in Table 5.

Table 5
Distance Between Tree Canopies by Percent Slope

Percent of Slope	Required Distances Between Edge of Mature Tree Canopies [1]
0–20	10 feet
21–40	20 feet
41+	30 feet

1 Determined from canopy dimensions as described in Sunset Western Garden Book (Current Edition)
Source: 2014 SDCCFC Section 4907.3.1. County of San Diego.

Environmentally Sensitive Areas/Riparian Areas

Once the fuel modification zones are in place, there will not be a need to expand them as they have been planned conservatively larger than necessary. However, if unforeseen circumstances were to arise that removal of non-native species, such as Mexican fan palms (*Washingtonia robusta*), Giant Reed (*Arundo donax*), or Eucalytpus species for hazard reduction within an area considered environmentally sensitive, it would require approval from the County and the appropriate resource agencies (California Department of Fish and Game, U.S. Fish and Wildlife

Service, U.S. Army Corps of Engineers) prior to any vegetation management activities occurring within those areas.

Pre-Construction Requirements

- Perimeter fuel modification areas must be implemented and approved by the SMCFPD prior to combustible materials being brought on site.
- Existing flammable vegetation shall be reduced by 50% on vacant lots upon commencement of construction.
- Dead fuel, ladder fuel (fuel which can spread fire from ground to trees), and downed fuel shall be removed and trees/shrubs shall be properly limbed, pruned, and spaced per this plan.

Undesirable Plants

Certain plants are considered to be undesirable in the landscape due to characteristics that make them highly flammable. These characteristics can be physical or chemical. The plants included in the Prohibited Plant List (Appendix H) are unacceptable from a fire safety standpoint, and shall not be planted on the site unless otherwise approved by the SMCFPD.

5.6.3 Fuel Modification Area Vegetation Maintenance

All fuel modification area vegetation management shall be completed annually by May 15 of each year and more often as needed for fire safety, as determined by the SMCFPD. The Project HOA or another approved entity shall be responsible for all vegetation management throughout the common and FMZ areas of the project site. The Project HOA shall be responsible for ensuring long-term funding and ongoing compliance with all provisions of this FPP, including vegetation planting, fuel modification, vegetation management, and maintenance requirements throughout the private portions of The Sweetwater Vistas site.

6 ADDITIONAL STRUCTURAL PROTECTION MEASURES FOR NON-CONFORMING STRUCTURE SETBACKS

As previously mentioned, due to constraints associated with limited building area and positioning of townhouse product, some of the structure setbacks are limited to between 15 and 20 feet from top of slope, which is less than the 30 feet setback suggested in the Fire Code for a two story structure. As such, the following additional measures will be implemented to "mitigate" potential structure fire exposure related to structure setback from top of slope requirements on this project. These measures are customized for this site, its unique topographical and vegetative conditions, and focus on providing functional equivalency in lieu of the required structure setback.

6.1 Non-combustible Fire Walls

The project's slopes and the elevated lots/pads adjacent the open space areas, provide an opportunity to place heat-deflecting fire walls of masonry construction with fire-rated glazing that are eight feet in height (roughly lower three feet masonry construction and upper five feet dual pane, one pane tempered glazing or equivalent and meeting Chapter 7A and/or SMCFPD or SDCFA approval). The fire walls will be incorporated at top of slope/edge of the building pad where appropriate structure setbacks are not achievable. Figure 6, the Site Fire Safety Plan, shows the locations for the fire walls within Lots #1 and #3. The fire walls provide a vertical, non-combustible surface in the line of heat, fumes, and flame that can travel up the slope. Once these fire byproducts intersect the wall, they are deflected upward or, in the case where lighter fuels are encountered, they are quickly consumed, heat and flame are absorbed or deflected by the wall, and the fuel burns out within a short (30 second–2 minute) time frame (Quarles and Beall 2002). Walls like these have proven to deflect heat and airborne embers and are consistent with NFPA 1144 Standard for Reducing Structure Ignition Hazards from Wildland Fire – 2008 Edition, Section 5.1.3.3 and A.5.1.3.3 and International Urban Wildland Interface Code (ICC 2012). NFPA 1144, A.5.1.3.3 states: "Noncombustible walls and barriers are effective for deflecting radiant heat and windblown embers from structures." As such, the fire walls will provide at least functional equivalency for structure setbacks.

Example non-combustible fire wall

6.2 Exterior Windows

Since the structures will be hardened to wildland urban interface standards, they will be ignition resistant. However, a potentially vulnerable structure component with regard to radiant or

convective heat exposure would be the WUI exposed side windows for structures on lots #1 and #3. To address this issue, it is worthwhile to examine the structure ignitability modeling, independent ignition experiments, and case studies that support fuel treatments as low as roughly 34 feet from structures, and compare them with the project. Cohens' (1995) structure ignitability model (SIAM) assesses ignitability of bare wood when exposed to a continuous heat source. The model assumes a worst-case condition of a constant 1700 degrees (F). A constant, maximum heat source is typically not the case during a wildfire due to the movement of a fire, non-uniform vegetation distribution, and the lack of a uniform, constant flame front.

The analysis conducted for this report indicates that the structure setbacks of a minimum of 15 feet which are augmented with a minimum of 100 feet separation (FMZs) from the fuels is consistent with study results for separating the structures from the short-duration heat and flame associated with a fire burning within one of the preserved riparian woodland drainages. The typical duration of large flames from burning vegetation is on the order of 1 minute and up to several minutes for larger fuels at a specific location (Cohen 1995; Butler et al. 2004, Ramsay and Rudolph 2003, Cohen and Quarles 2011)). Tests of various glazing products indicate that single pane, tempered glass failure may occur between 120–185 seconds from exposure (University of California 2011; Manzello et al. 2007) but those tests include direct and constant heating that would not be experienced during a wildfire on this site. Depending on the heat applied and the type of glass used in the various studies, the cracking/failure time varied. However, given the short duration of maximum heat (likely several minutes for the riparian habitat), the loss of heat over distance (100 feet minimum), the dual pane, two pane tempered glazing specified for this project, wildfire heat and flame experienced by the windows from the wildland fire is not expected to be enough (in temperature or duration) to cause failure of both panes. Quarles et al. (2010) provides strong endorsement for tempered glass performance. His research and tests conclude that multi-pane (2–3 panes) with at least one pane tempered is well-suited for wildfire exposures. He indicates that tempered glass is at least four times stronger and much more resistant to thermal exposures than normal annealed glass. The use of code required dual pane, one pane tempered glass provides several benefits, with thermal exposure performance the most important for this study. This FPP requires both panes tempered for the side of the structure facing the open space areas to improve the strength of the windows.

7 CUMULATIVE IMPACT ANALYSIS

Cumulative impacts from multiple projects can cause fire response service decline and must be analyzed for each project. The Sweetwater Vistas and its proposed 218 residential units and approximately 630 residents represent minimal anticipated increases in fire and emergency medical response needs. However, when considered cumulatively with other projects planned in the SMCFPD's jurisdictional area, the cumulative impact is considered potentially significant.

Despite the generally low increase in number of calls per year from The Sweetwater Vistas site, the project contributes to the cumulative impact on fire services, when considered with other anticipated projects within the SMCFPD's primary response area. Without additional resources over time, the cumulative impact may result in a situation where the SMCFPD response capabilities erode and service levels decline. The project's contributions to fire resources through building fees and ongoing property tax allocations combined with the same contributions from future development in the area are expected to result in funding that can be used for enhancing SMCFPD's response capabilities and at least maintaining the current standards for firefighting and emergency response. Over the long term, it is anticipated that SMCFPD will be able to perform its mission into the future at levels consistent with the County Consolidated Fire Code and the San Diego County General Plan.

The requirements described in this FPP, including ignition-resistive construction, additional fire protection systems, and fuel modification/vegetation management, are designed to aid firefighting personnel such that The Sweetwater Vistas people and structures are protected and impacts to the SMCFPD are minimal. Based on the type of wildfire anticipated/modeled for this area and the corresponding fire protection project features, including conformance with building and fire codes, ongoing maintenance of roads, infrastructure, vegetation management and defensible space results in a potentially significant, but mitigated cumulative impact.

INTENTIONALLY LEFT BLANK

8 CONCLUSION

This FPP is submitted in support of an application for project entitlement of The Sweetwater Vistas development project. It is submitted in compliance with requirements of County of San Diego and SMCFPD Fire Codes. The requirements in this document meet fire safety, building design elements, fuel management/modification, and landscaping recommendations of the SMCFPD. Fire and Building Codes and other local, county, and state regulations in effect at the time of each building permit application supersede these recommendations unless the FPP recommendation is more restrictive. Where the project does not strictly comply with the Code, alternative materials and methods have been proposed that provide functional equivalency as the code intent.

The recommendations provided in this FPP have been designed specifically for the proposed construction of structures adjacent the WUI zone at The Sweetwater Vistas project site. The project site's fire protection system includes a redundant layering of protection methods that have been shown through post-fire damage assessments to reduce risk of structural ignition.

Modern infrastructure will be provided along with implementation of the latest ignition resistant construction methods and materials. Further, all structures are required to include interior sprinklers consistent with 2013 CFC and SMCFPD Ordinance 2013-1. Fuel modification will occur within property borders on exposed edges of the project site. The fuel modification zones will be maintained annually by the HOA. Maintenance includes removing all dead and dying materials and maintaining appropriate horizontal and vertical spacing. In addition, plants that establish or are introduced to the fuel modification zone that are not on the approved plant list will be removed.

Ultimately, it is the intent of this FPP to guide, through code and other project specific requirements, the construction of structures that are defensible from wildfire and, in turn, do not represent significant threat of ignition source for the adjacent native habitat. It must be noted that during extreme fire conditions, there are no guarantees that a given structure will not burn. Precautions and mitigating actions identified in this report are designed to reduce the likelihood that fire would impinge upon the proposed structures. There are no guarantees that fire will not occur in the area or that fire will not damage property or cause harm to persons or their property. Implementation of the required enhanced construction features provided by the applicable codes and the mitigating fuel modification requirements provided in this FPP will accomplish the goal of this FPP to assist firefighters in their efforts to defend these structures and reduce the risk associated with this project's WUI location.

The proposed development is not to be considered a shelter-in-place community. Therefore, it is recommended that the homeowners or other occupants who may reside within The Sweetwater

Vistas Project neighborhood adopt a conservative approach to fire safety. This approach must include maintaining the landscape and structural components according to the appropriate standards and embracing a "Ready, Set, Go![5]" stance on evacuation. Accordingly, occupants should evacuate the residence and the area as soon as they receive notice to evacuate, or sooner, if they feel threatened by wildfire or structure fire in a nearby residence. Fire is a dynamic and somewhat unpredictable occurrence and it is important for residents to educate themselves on practices that will improve their home survivability and their personal safety.

[5] International Fire Chiefs Association "Ready, Set, Go" website link: http://wildlandfirersg.org/ https://www.sanmiguelfire.org/Ready,Set,Go! National Video

9 REFERENCES

Advantage Environmental Consultants LLC. 2014. Biological Assessment Report, Norman Property, San Marcos, California. July 21, 2014. 17p.

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

Andrews, Patricia L.; Collin D. Bevins; and Robert C. Seli. 2004. BehavePlus fire modeling system, version 3.0: User's Guide. Gen. Tech. Rep. RMRS-GTR-106 Ogden, Utah: Department of Agriculture, Forest Service, Rocky Mountain Research Station. 132p.

Butler, B.W., J. Cohen, D.J. Latham, R.D. Shuette, P. Spoko, K.S. Shannon, D. Jimenez, and L.S. Bradshaw. 2003. Measurements of radiant emissive power and temperatures in crown fires. Canadian Journal of Forest Research. 34:1577–1587.

Cohen, Jack D. 1995. Structure ignition assessment model (SIAM). In: Weise, D.R.; Martin, R.E., technical coordinators. Proceedings of the Biswell symposium: fire issues and solutions in urban interface and wildland ecosystems. 1994 February 15-17; Walnut Creek, CA. Gen. Tech. Rep. PSW-GTR-158. Albany, California: Pacific Southwest Research Station, Forest Service, U.S. Department of Agriculture; 85-92

Cohen, Jack and Steve Quarles. 2011. Structure Ignition Assessment Model; The Origins and Basis of SIAM. From presentation at the 2011 NFPA Wildland Fire - Backyard and Beyond Conference in October 2011.

DWR (California Department of Water Resources). 2015. Website at http://cdec.water.ca.gov/staInfo.html. Accessed website July 2015.

FRAP (Fire and Resource Assessment Program). 2014. California Department of Forestry and Fire Protection. http://frap.cdf.ca.gov/.

Helix Environmental Planning, Inc. 2015. Conceptual Boundary Line Adjustment Analysis. Biological Letter Report to Terry Plolwden. February 4, 2015.

IBHS (Institute for Business and Home Safety). 2008. Megafires: The Case for Mitigation. 48 pp.

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

Keeley, J.E. and C.J. Fotheringham. 2003. "Impact of Past, Present, and Future Fire Regimes on North American Mediterranean Shrublands." In *Fire and Climatic Change in Temperate Ecosystems of the Western Americas,* edited by T.T. Veblem, W.L. Baker, G. Montenegro, and T.W. Swetnam, 218–262. New York, New York: Springer-Verlag.

Keeley, J.E. 2004. "Invasive Plants and Fire Management in California Mediterranean-Climate Ecosystems." Edited by M. Arianoutsou. *In 10th MEDECOS-International Conference on Ecology, Conservation Management*. Rhodes, Greece.

Manzello, Samuel, R. Gann, S. Kukuck, K. Prasad, and W. Jones. 2007. An Experimental Determination of a Real Fire Performance of a Non-Load Bearing Glass Wall Assembly. National Institute of Standards and Technology. 13 pp.

NFPA 71. Standard for the Installation, Maintenance, and Use of Signaling Systems for Central Station Service.

NFPA 1144. Standard for Reducing Structure Ignition Hazards from Wildland Fire. 2008. Technical Committee on Forest and Rural Fire Protection. Issued by the Standards Council on June 4, 2007, with an effective date of June 24, 2007. Approved as an American National Standard on June 24, 2007.

Quarles, Stephen, Yana Valachovic, Gary Nakamura, Glenn Nader, and Michael De Lasaux. 2010. Home Survival in Wildfire Prone Areas – Building Materials and Design Considerations. 22 pp.

Ramsay, Caird and Lisle Rudolph. 2003. Landscaping and Building Design for Bushfire Areas. Chapter 2.

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

SMCFPD (San Miguel Consolidated Fire Protection District). 2015a. 2014 Monthly Activity Report. January 14, 2015.

SMCFPD. 2015b. Website access http://www.sanmiguelfire.org. Accessed website March 3, 2015.

SANDAG (San Diego Association of Governments). 2014. Average persons per dwelling unit statistics. Website access: http://www.sandag.org/.

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

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

University of California Agriculture and Natural Resources. 2011. Web Site: Builders Wildfire Mitigation Guide. http://firecenter.berkeley.edu/bwmg/windows-1.html

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

WRCC (Western Regional Climate Center). 2014. "Climate of California." Western Regional Climate Center. Accessed March 2015. http://www.wrcc.dri.edu/narratives/california/.

INTENTIONALLY LEFT BLANK

10 LIST OF PREPARERS

Project Manager

Michael Huff
Fire Protection Planner; San Diego County California Environmental Quality Act Consultant List
Dudek

Fire Behavior Modeling and Plan Preparer

Michael Scott
Fire Protection Planner
Dudek

INTENTIONALLY LEFT BLANK

APPENDIX A

Photograph Log

Photograph log

Sweetwater Vistas

Photograph 1. View of southern and western portions of property (inside yellow dotted line). Red arrow illustrates coastal sage scrub fuel type modeled for fire run #3 above Lot 2.

Photograph 2. View of northern and eastern portions of property (inside yellow dotted line) . Note residential development to the north of the project site.

Photograph 3. Photograph of primary access roadway (Pointe Parkway) into western portion of development. Pointe Parkway connects with Jamacha Bivd. to the south.

Photograph 4. View of secondary access to project site along Avenida Bosques and north of the project site.

Photograph 5. Photograph of secondary access entrance into the project site at the current terminus of Avenida Bosques.

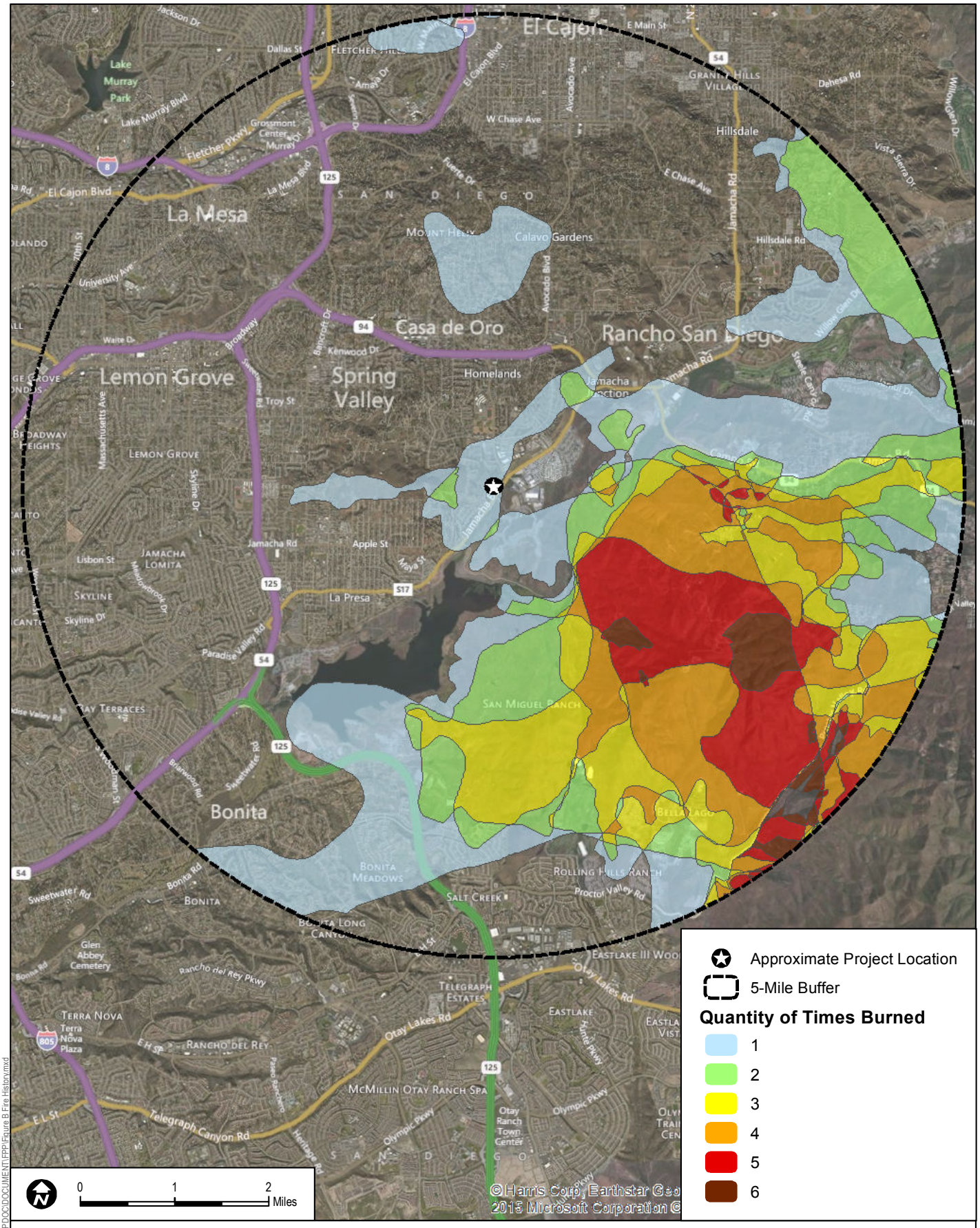
Photograph 6. Coastal sage scrub (off-site fuels) located east and south of project area. Fuels modeled for fire run #1.

Photograph 7. Photograph of riparian habitat that occurs in the central portion of the project area. Fuels modeled for fire fun #4.

Photograph 8. Another view of riparian fuel type modeled for fire run #3.

APPENDIX B

Fire History Map



DUDEK

Sweetwater Vistas Project - Fire Protection Plan

Appendix B
Fire History

Path: Z:\Projects\885401\MAPDOC\DOCUMENT\FPP\Figure B Fire History.mxd

APPENDIX C

BehavePlus Fire Behavior Analysis

APPENDIX C
BehavePlus Fire Behavior Analysis

BEHAVEPLUS FIRE BEHAVIOR MODELING

Fire behavior modeling includes a high level of analysis and information detail to arrive at reasonably accurate representations of how wildfire would move through available fuels on a given site. Fire behavior calculations are based on site-specific fuel characteristics supported by fire science research that analyzes heat transfer related to specific fire behavior. To objectively predict flame lengths, spread rates, and fireline intensities, the BehavePlus 5.0.5 fire behavior modeling system was applied using predominant fuel characteristics, slope percentages, and extreme weather variables for the site.

Predicting wildland fire behavior is not an exact science. As such, the movement of a fire will likely never be fully predictable, especially considering the variations in weather and the limits of weather forecasting. Nevertheless, practiced and experienced judgment, coupled with a validated fire behavior modeling system, results in useful and accurate fire prevention planning information.

To be used effectively, the basic assumptions and limitations of BehavePlus must be understood.

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

Although BehavePlus has some limitations, it can still provide valuable fire behavior predictions which can be used as a tool in the decision-making process. In order to make reliable estimates of fire behavior, one must understand the relationship of fuels to the fire environment and be able to recognize the variations in these fuels. Natural fuels are made up of the various components of vegetation, both live and dead, that occur on a site. The type and quantity will depend upon the soil, climate, geographic features, and the fire history of the site. The major fuel groups of grass,

shrub, trees, and slash are defined by their constituent types and quantities of litter and duff layers, dead woody material, grasses and forbs, shrubs, regeneration, and trees. Fire behavior can be predicted largely by analyzing the characteristics of these fuels. Fire behavior is affected by seven principal fuel characteristics: fuel loading, size and shape, compactness, horizontal continuity, vertical arrangement, moisture content, and chemical properties.

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

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

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

- Non-Burnable Models NB1, NB2, NB3, NB8, NB9
- Grass Models GR1 through GR9
- Grass-shrub Models GS1 through GS4
- Shrub Models SH1 through SH9
- Timber-understory Models TU1 through TU5
- Timber litter Models TL1 through TL9
- Slash blowdown Models SB1 through SB4

BEHAVEPLUS FIRE BEHAVIOR MODELING INPUTS

Vegetation/Fuels

To support the fire behavior modeling efforts conducted for this Fire Protection Plan (FPP), the different vegetation types observed on site were classified into the aforementioned numeric fuel models. The site and off site vegetation is dominated primarily by Diegan Coastal Sage Scrub (Fuel Model SCAL 18), Moderate Load Chaparral (Fuel Model sh2), and riparian forest (Fuel Model 9). Modeled areas include the sage scrublands west and east, Chaparral and riparian forest within and south of the proposed project site, totaling four model runs. These sites were selected based on the strong likelihood of fire approaching from these directions during an on-shore weather pattern (Model Runs 2 and 3) and during a Santa Ana wind-driven fire event (Model Runs 1 and 4). Table 1 provides a description of the fuel models used in BehavePlus analysis for this project.

Table 1
BehavePlus Fuel Models

Vegetation Type	Fuel Model
Diegan Coastal Sage Scrub	SCAL 18
Riparian Forest	9
Moderate Load Chaparral	sh2

Weather

Fire behavior modeling conducted in support of this FPP utilized the guidelines and standards presented by the County of San Diego, Department of Planning and Land Use[1]. These guidelines identify acceptable fire weather inputs for extreme fire conditions during summer months and Santa Ana fire weather patterns. The County analyzed and processed fire weather from Remote Automated Weather Stations between April 15 to December 31 in order to represent the general limits of the fire season. Data provided by the County's analysis included temperature, relative humidity, and sustained wind speed and is categorized by weather zone, including Maritime, Coastal, Transitional, Interior, and Desert.

The prevailing wind pattern is from the west, but the presence of the Pacific Ocean causes a diurnal wind pattern known as the land/sea breeze system. During the day, winds are typically from the west–southwest (sea), and, at night, winds are from the northeast (land). During the summer season, the diurnal winds can be slightly stronger than the winds during the winter season due to greater pressure gradient forces. Surface winds can also be influenced locally by

[1] County of San Diego Report Format and Content Requirements – Wildland Fire and Fire Protection (August 31, 2010). On-line at http://www.sdcounty.ca.gov/dplu/docs/Fire-Report-Format.pdf

topography and slope variations. The highest wind velocities are typically associated with downslope, canyon, and Santa Ana winds.

In southern California the fire season typically starts in June as vegetation begins to dry out after winter and spring rains and typically ends in October, although fire weather may be present year round (Schroeder and Buck 1970). The highest fire danger for this area coincides with the Santa Ana winds. Santa Ana wind conditions are a reversal of the prevailing southwesterly winds that usually occur on a region-wide basis during late summer and early fall. They are dry, warm winds that flow from the higher desert elevations in the north through the mountain passes and canyons. As they converge through the canyons, their velocities increase. Consequently, peak velocities are highest at the mouths of canyons and dissipate as they spread across valley floors.

To evaluate potential fire behavior for the project site, Dudek utilized the BehavePlus (v. 5.0.5) fire behavior modeling software package to determine fuel moisture values and expected fire behavior for the site. The temperature, relative humidity, and wind speed data for the Coastal[2] weather zone were utilized for this FPP based on the project location. Reference fuel moistures were calculated in BehavePlus and were based on site-specific topographic data inputs. Fire behavior modeling input values are presented below in Table 2.

Topography

The topography of The Pointe site is discussed in greater detail in the FPP. Slope is a measure of angle in degrees from horizontal and can be presented in units of degrees or percent. Slope is important in fire behavior analysis as it affects the exposure of fuel beds. Additionally, fire burning uphill spreads faster than those burning on flat terrain or down hill as uphill vegetation is pre-heated and dried in advance of the flaming front, resulting in faster ignition rates. Slope values for the East Mission site were measured from site topographic maps and are presented in units of percent.

The fire behavior modeling input variables for the project site are presented in Table 2. Locations for each modeling run are presented graphically in Figure 4 of the FPP.

Table 2
BehavePlus Fire Behavior Modeling Inputs

Variable	Summer Weather (Onshore Flow)	Peak Weather (offshore/Santa Ana Condition)
Fire Model Runs	2 and 3	1 and 4
Fuel Model	FM9, sh2, SCAL 18	FM9, sh2. SCAL18
1h Moisture	3%	2%
10h Moisture	5%	3%
100h Moisture	7%	5%

[2] http://mappingsandiego.com/viewMap.html

Table 2
BehavePlus Fire Behavior Modeling Inputs

Variable	Summer Weather (Onshore Flow)	Peak Weather (offshore/Santa Ana Condition)
Live Herbaceous Moisture	60%	30%
Live Woody Moisture	90%	50%
20-ft Wind Speed	10-20 mph	30-40 mph (50 mph gusts)
Wind Adjustment Factor	0.6 (sh2, SCAL18); 0.4 (FM9)	0.6 (sh2, SCAL18); 0.4 (FM9)
Slope Steepness	5-35 %	10-27 %

BEHAVEPLUS FIRE BEHAVIOR MODELING RESULTS

Fire behavior for the site was calculated in four different locations using worst-case fuels and topography (steepest slopes). Two of the modeling scenarios analyzed potential fire behavior within and along the southern edge of the proposed development (Model Runs 2 and 4) during peak fire weather conditions. The other two modeling scenarios (Model runs 1 and 3) analyzed potential fire behavior along the western and eastern edges of the proposed development during summer weather conditions.

Three fire behavior variables were selected as outputs from the BehavePlus analysis conducted for The Pointe site, and include flame length (feet), rate of spread (mph), and fireline intensity (BTU/feet/second). The aforementioned fire behavior variables are an important component in understanding fire risk and fire agency response capabilities. Flame length, the length of the flame of a spreading surface fire within the flaming front, is measured from midway in the active flaming combustion zone to the average tip of the flames (Andrews, Bevins, and Seli 2004). It is a somewhat subjective and non-scientific measure of fire behavior, but is extremely important to fireline personnel in evaluating fireline intensity and is worth considering as an important fire variable (Rothermel 1983). Fireline intensity is a measure of heat output from the flaming front, and also affects the potential for a surface fire to transition to a crown fire. Fire spread rate represents the speed at which the fire progresses through surface fuels and is another important variable in initial attack and fire suppression efforts. The information in Table 3 presents an interpretation of these fire behavior variables as related to fire suppression efforts. The results of fire behavior modeling efforts are presented in Table 4, as well as in Table 3 of the FPP.

Table 3
Fire Suppression Interpretation

Flame Length (ft)	Fireline Intensity (Btu/ft/s)	Interpretations
Under 4 feet	Under 100 BTU/ft/s	Fires can generally be attacked at the head or flanks by persons using hand tools. Hand line should hold the fire.

Table 3
Fire Suppression Interpretation

Flame Length (ft)	Fireline Intensity (Btu/ft/s)	Interpretations
4 to 8 feet	100-500 BTU/ft/s	Fires are too intense for direct attack on the head by persons using hand tools. Hand line cannot be relied on to hold the fire. Equipment such as dozers, pumpers, and retardant aircraft can be effective.
8 to 11 feet	500-1000 BTU/ft/s	Fires may present serious control problems -- torching out, crowning, and spotting. Control efforts at the fire head will probably be ineffective.
Over 11 feet	Over 1000 BTU/ft/s	Crowning, spotting, and major fire runs are probable. Control efforts at head of fire are ineffective.

Source: BehavePlus 5.0.5 fire behavior modeling program (Andrews, Bevins, and Seli 2004)

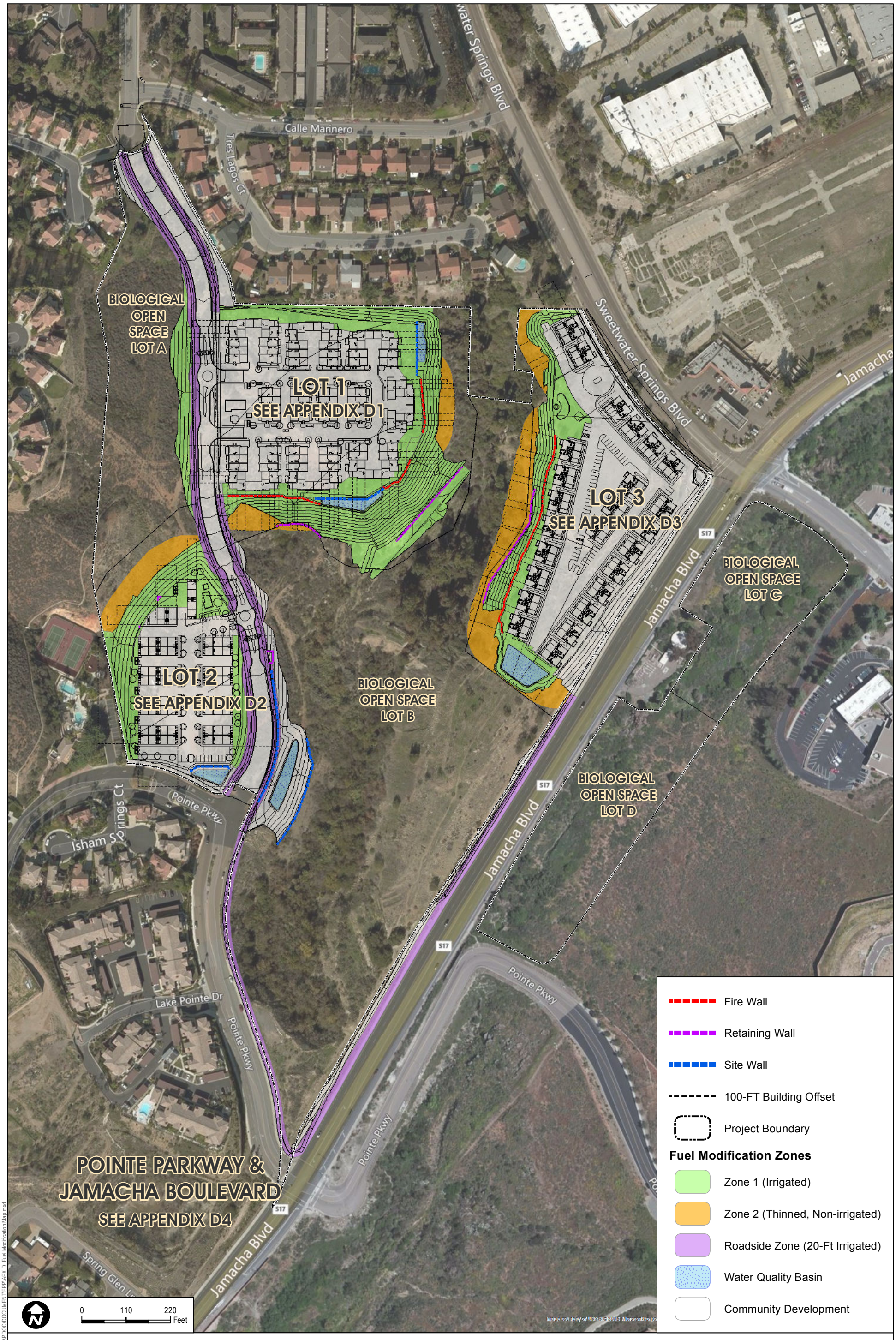
Table 4
BehavePlus Fire Behavior Modeling Results

Model Run	Fuel Model(s)	Flame Length (feet)	Fireline Intensity (Btu/ft/s)	Surface Rate of Spread (mph)
1	SCAL 18	39.3 to 44.2 (48.4)*	16,549 to 21.382 (26,123)*	2.59 to 3.35 (4.09)*
2	9, sh2	3.2 to 8.5	70 to 599	< 1.0
3	SCAL 18	19.9 to 26.5	3,775 to 7053	0.65 to 1.21
4	9, sh2	7.9 to 18.2 (11.7 to 21.0)*	504 to 3,117 (1,195 to 4,237)*	0.7 to 1.37 (1.67 to 1.86)*

Note: * - Parentheses represents modeling results for 50 mph wind gusts.

APPENDIX D

Fuel Modification Plan



SOURCES: BING MAPS, FUSCOE ENGINEERING 2016

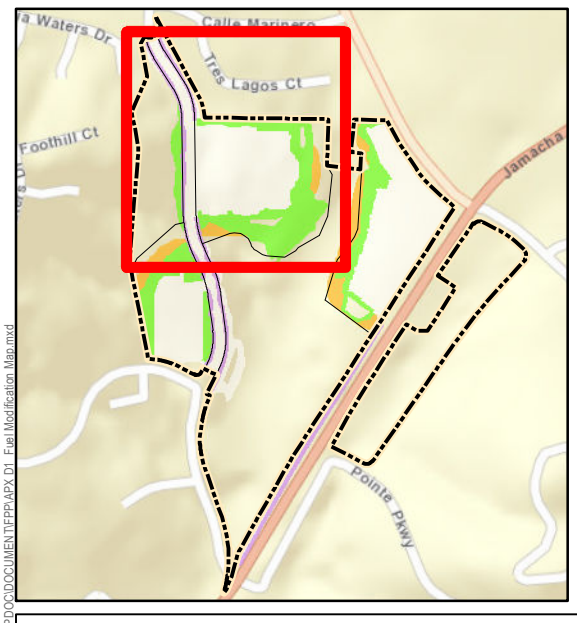
DUDEK

APPENDIX D

Fuel Modification Zones Overview

Sweetwater Vistas Project - Fire Protection Plan

Path: Z:\Projects\IS8154011\MAPDOC\DOCUMENT\FPP\APX D_Fuel Modification Map.mxd



- Fire Wall
- Retaining Wall
- Site Wall
- 100-FT Building Offset
- Project Boundary
- Water Quality Basin

Fuel Modification Zones

- Zone 1 (Irrigated)
- Zone 2 (Thinned, Non-irrigated)
- Roadside Zone (20-Ft Irrigated)
- Community Development

0 60 120 Feet

SOURCES: BING MAPS, FUSCOE ENGINEERING 2016

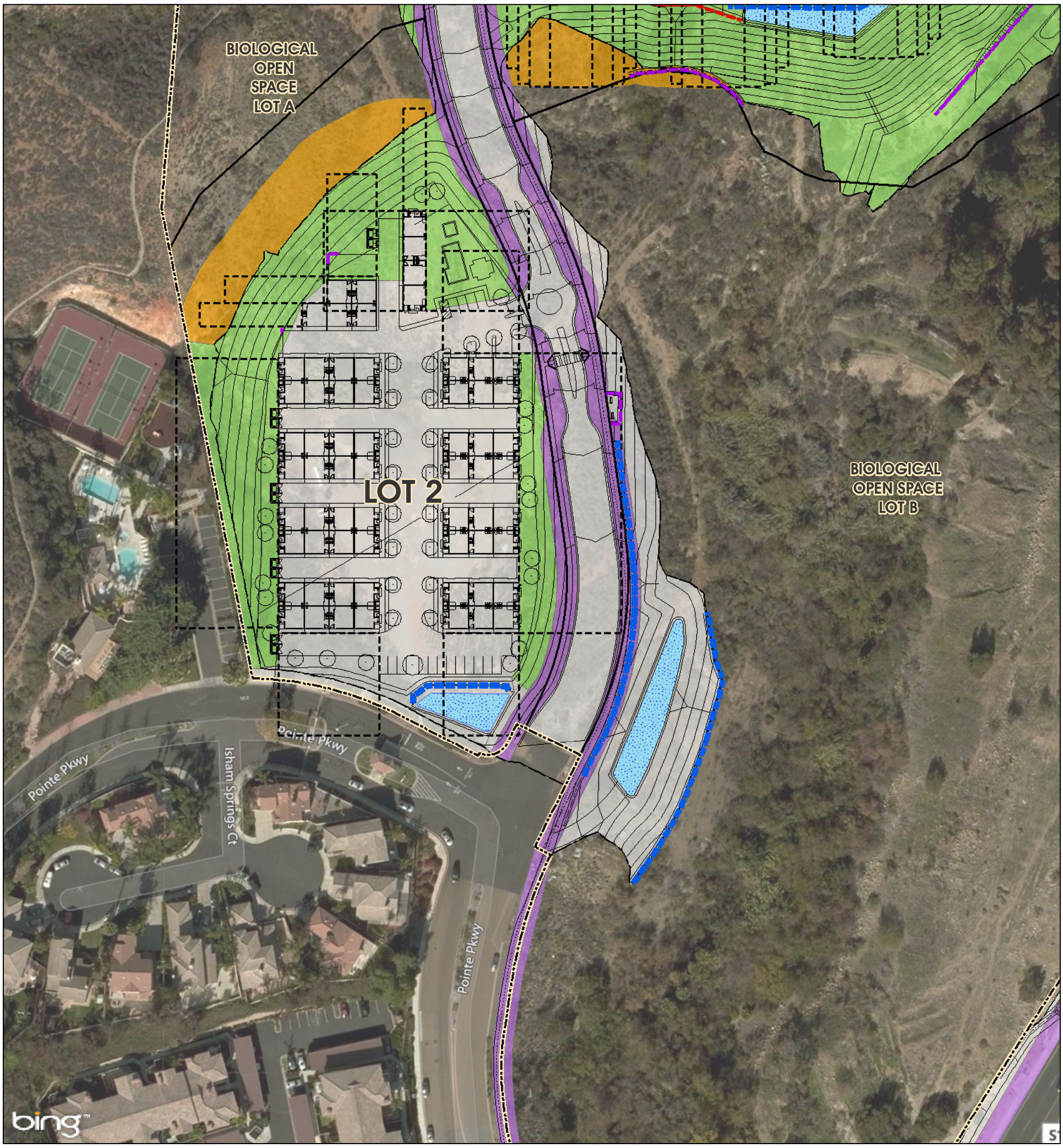
DUDEK

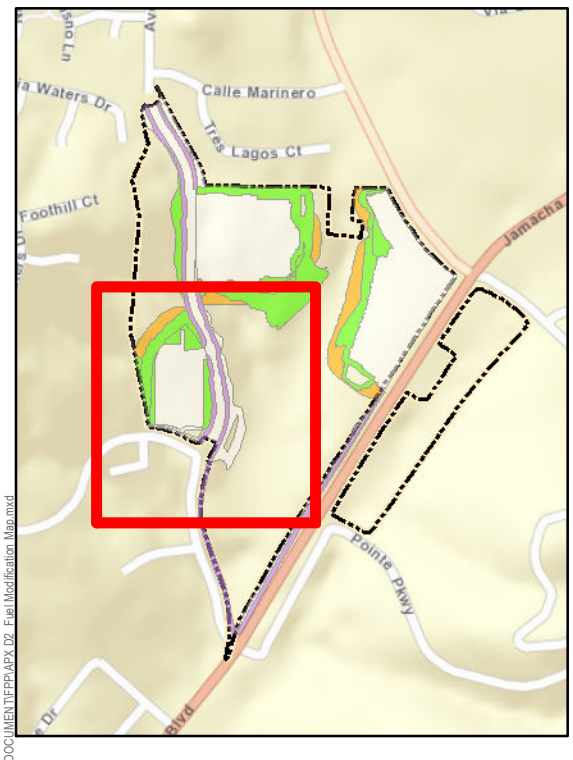
APPENDIX D1

Fuel Modification Zones

Sweetwater Vistas Project - Fire Protection Plan

Path: Z:\Projects\685401\MAPDOC\DOCUMENT\FPP\APX D1_Fuel Modification Map.mxd





Fire Wall

Retaining Wall

Site Wall

100-FT Building Offset

Project Boundary

Water Quality Basin

Fuel Modification Zones

Zone 1 (Irrigated)

Zone 2 (Thinned, Non-irrigated)

Roadside Zone (20-Ft Irrigated)

Community Development

0 60 120 Feet

SOURCES: BING MAPS, FUSCOE ENGINEERING 2016

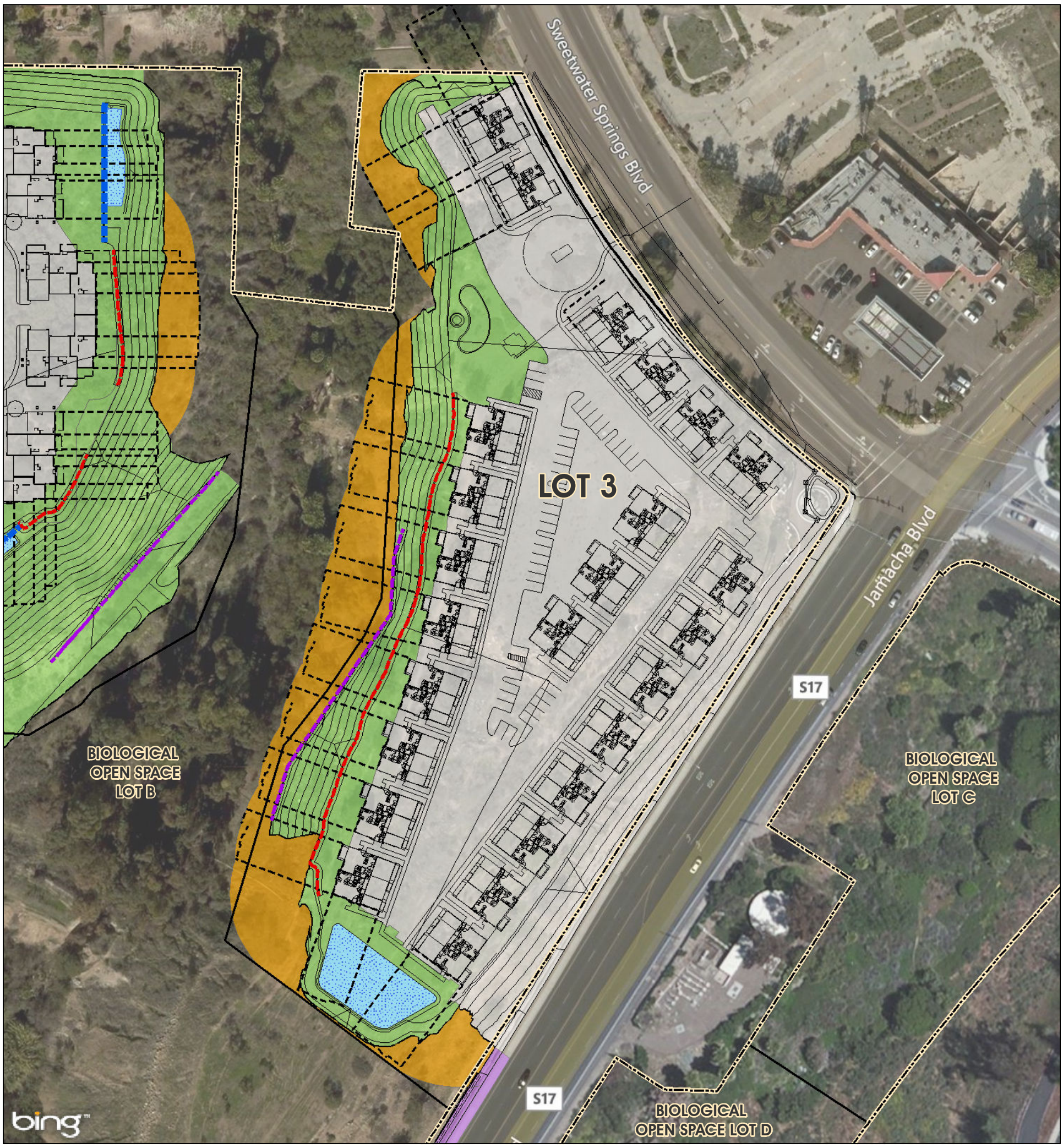
DUDEK

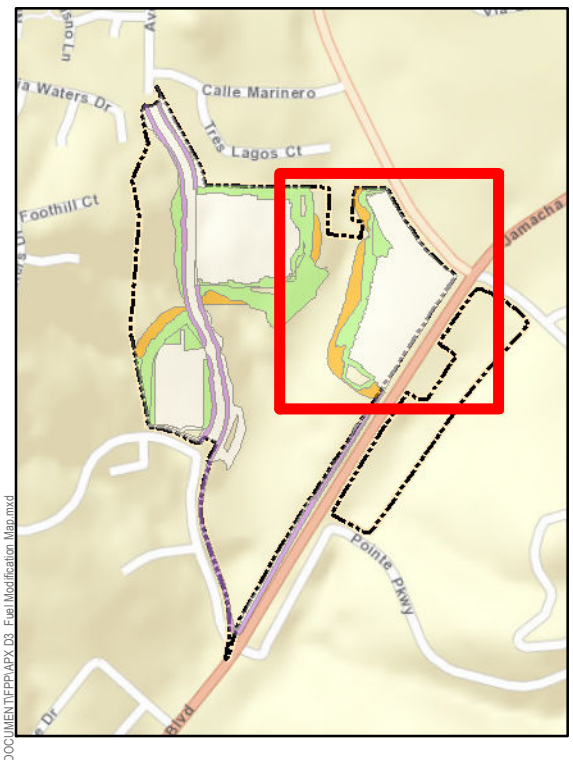
APPENDIX D2

Fuel Modification Zones

Sweetwater Vistas Project - Fire Protection Plan

Path: Z:\Projects\08541101\MAPDOC\DOCUMENT\FPP\APX D2 Fuel Modification Map.mxd





- Fire Wall
- Retaining Wall
- Site Wall
- Limit of Grading
- Project Boundary
- Water Quality Basin

Fuel Modification Zones

- Zone 1 (Irrigated)
- Zone 2 (Thinned, Non-irrigated)
- Roadside Zone (20-Ft Irrigated)
- Community Development

0 60 120 Feet

SOURCES: BING MAPS, FUSCOE ENGINEERING 2016

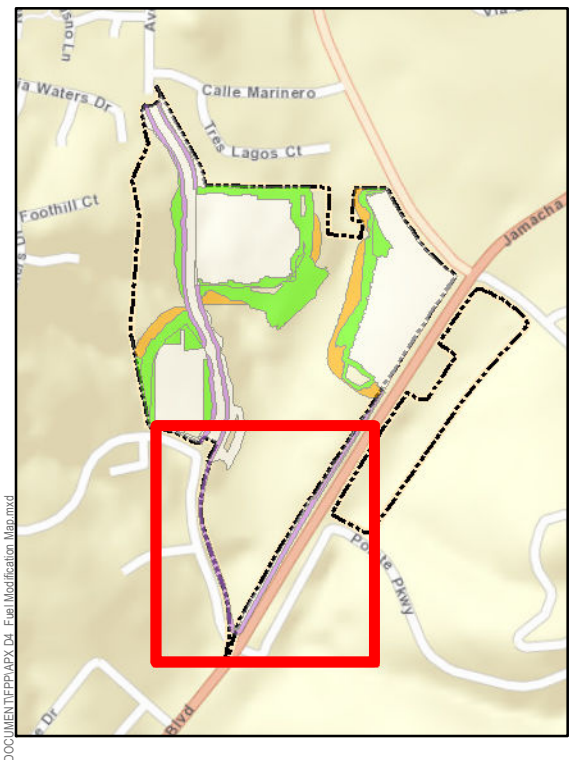
DUDEK

APPENDIX D3

Fuel Modification Zones

Sweetwater Vistas Project - Fire Protection Plan

Path: Z:\Projects\08545101\MAPDOC\DOCUMENT\FPP\APX D3 Fuel Modification Map.mxd



Site Wall

100-FT Building Offset

Project Boundary

Water Quality Basin

Fuel Modification Zones

Zone 1 (Irrigated)

Roadside Zone (20-Ft Irrigated)

Community Development

0 60 120 Feet

SOURCES: BING MAPS, FUSCOE ENGINEERING 2016

DUDEK

APPENDIX D4

Fuel Modification Zones

Sweetwater Vistas Project - Fire Protection Plan

Path: Z:\Projects\08540\1\MAPDOC\DOCUMENT\FPP\APX_D4_Fuel Modification Map.mxd

APPENDIX E

County of San Diego
Project Facility Availability Form - Fire

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

F

Please type or use pen

Sweetwater Vistas LLC — 619.906.4352
Owner's Name — Phone

1620 Fifth Avenue, Suite 400
Owner's Mailing Address — Street

San Diego, CA 92101
City — State — Zip

ORG_____
ACCT_____
ACT_____
TASK_____
DATE_____ AMT $_____

DISTRICT CASHIER'S USE ONLY

SECTION 1. PROJECT DESCRIPTION — TO BE COMPLETED BY APPLICANT

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

B.
- [x] Residential . . . . . Total number of dwelling units 255 multi-family
- [ ] Commercial . . . . . Gross floor area
- [ ] Industrial . . . . . Gross floor area
- [ ] Other . . . . . Gross floor area

C. Total Project acreage 51.9 Total lots 5 Smallest proposed lot 3.74 ac

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

505-672-03	505-672-09
505-672-10	505-672-37
505-672-07	
505-672-23	

Thomas Guide. Page _____ Grid _____

NW Corner Sweetwater Springs & Jamacha Blvds
Project address — Street

Spring Valley — 91977
Community Planning Area/Subregion — Zip

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

Applicant's Signature: [signature] Date: 7/14/15

Address: 1620 Fifth Avenue, Ste 400 San Diego, CA 92012 Phone: 619.906.4352

(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: San Miguel Consolidated Fire Protection District

Indicate the location and distance of the primary fire station that will serve the proposed project:
Sta. 15 2850 Via Orange Way, Spring Valley, CA 91978

A.
- [x] 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 2 minutes.
- [ ] Fire protection facilities are not expected to be adequate to serve the proposed development within the next five years.

C.
- [x] District conditions are attached. Number of sheets attached: 3
- [ ] 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.

- [x] 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.

Authorized Signature	Print Name and Title	Phone	Date
Tony Morgan	Tony Morgan DFM	619-660-5356	7-15-15

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

San Miguel Consolidated Fire Protection District

Serving the communities of Bostonia, Casa de Oro, Crest, Grossmont/Mt. Helix, La Presa, Rancho San Diego, Spring Valley, and unincorporated areas of El Cajon and La Mesa

July 15, 2015

San Diego County
Department of Planning and Land Use
5510 Overland Avenue, Suite 110
San Diego, CA 92123

Re: Sweetwater Vistas LLC, APN 505-672-03,07,09,10,23,37

Project Service Availability Letter
Additional Conditions Attachment

As applicable the following is a list of conditions of approval for the attached Project Service Availability Letter:

- ***Fire Sprinklers:*** Structures shall have an automatic fire sprinkler system installed per NFPA 13-D standards and San Miguel Consolidated Fire Protection District standards. Fire sprinkler plans shall be submitted and approved by the San Miguel Consolidated Fire Protection District prior to framing inspection.

- ***Site Inspections:*** At any time until project has received final approval, a site inspection may reveal conditions that have changed since service availability letter or plan review. When such discrepancies arise, field inspections shall take precedence.

- ***Street Numbers/Premises Identification:*** Approved numbers and/or addresses shall be placed on all new and existing buildings and at appropriate additional locations as to be plainly visible and legible from the street or roadway fronting the property from either direction of approach. Street numbers shall be in accordance with San Miguel Consolidated Fire Protection District Ordinance No. 2013-1.

- ***Fire Apparatus Access:*** Plans for fire apparatus access roads or for their modification shall be submitted to the fire department for review and approval prior to construction or modification.

- ***Fire Apparatus Access Roads,*** including private residential driveways, shall be required for every building hereafter constructed when any portion of an exterior wall of the first story is located more than 150 feet from the closest point of fire department vehicle access.

- ***Marking Fire Apparatus Access Roads:*** Approved signs or other approved notices shall be provided and maintained for fire apparatus access roads to identify such roads and prohibit the obstruction thereof or both.

- ***Dead Ends:*** Fire apparatus roads, including private driveways, more than 150 feet in length shall be provided with an approved means for turning the fire apparatus around. Turnaround requirements shall be in accordance with San Miguel Consolidated Fire Protection District Ordinance No. 2013-1. Clearly show the turnaround on the plot plan when submitting plans.

- ***Dimensions:*** Fire apparatus access roads shall have an unobstructed improved width of not less than twenty-four feet except for single-family residential driveways serving no more than one single-family dwelling shall have a minimum of sixteen feet of unobstructed improved width. All fire apparatus access roads shall have an unobstructed vertical clearance of not less than thirteen feet, six inches.

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

- ***Fire Access Road Name:*** All private roads within major subdivisions and private roads serving four or more parcels shall be named. The developers shall install one road name sign at each intersection as a part of the improvements. Installation shall be in accordance with San Diego County Design Standard Number DS-13.

- ***Turning Radius:*** The turning radius of a fire apparatus access road shall be 28 feet or as approved by the Chief.

- ***Grade:*** The gradient for a fire apparatus access roadway shall not exceed 20.0%. Grades exceeding 15.0% (incline or decline) shall not be permitted without mitigation. Minimal mitigation shall be the installation of a surface of Portland cement concrete with a heavy-broom finish, perpendicular to the direction of travel to enhance traction. The angle of departure and angle of approach of a fire access roadway shall not exceed 7 degrees or 12% or as approved by the Chief.

- ***Roadway Design Features:*** Roadway design features (speed bumps, speed humps, speed control dips, etc.) that may interfere with emergency apparatus responses shall not be installed on fire access roadways, unless they meet design criteria approved by the Chief.

- **Knox Switch:** Automatic gates must have Knox-brand key switches that override all functions and opens the gate.

- ***Gates:*** All gates or other structures or devices that could obstruct fire access roadways or otherwise hinder emergency operations are prohibited unless they meet standards approved by the Chief and receive Specific Plan Approval.

- ***Response Map Updates:*** Any new developments that necessitate updating of emergency response maps by virtue of new structures, hydrants, roadways or similar features, shall be required to provide map updates in a format compatible with current department mapping services, and shall be charged a reasonable fee for updating the response maps.

- ***Fire Hydrants:*** The location, number and type of fire hydrant connected to a water supply capable of delivering the required fire flow shall be provided on the public street or on the site of the premises or both to be protected as required and approved by the Chief. Fire hydrants shall be accessible to the fire department apparatus by roads meeting the requirements of Section 503.1.

- ***Clearance of Brush or Vegetative Growth From Structures:*** Clearance of brush or vegetative growth from structures, roadways, and improved property lines shall meet San Miguel Consolidated Fire Protection District Ordinance No. 94-3.

- ***Additional Requirements:*** There may be further conditions applied to this project at a later date.

If you have any questions, please contact me at 619-660-5356.

Sincerely,

Tony Morgan
Deputy Fire Marshal

APPENDIX F

County of San Diego

Project Facility Commitment - Water Form

County of San Diego, Planning & Development Services
PROJECT FACILITY COMMITMENT - Water
ZONING DIVISION

Please type or use pen

Sweetwater Vistas LLC — 619.906.4352
Owner's Name — Phone

1620 Fifth Avenue, Suite 400
Owner's Mailing Address — Street

San Diego — CA — 92010
City — State — Zip

ORG_____ **W**
ACCT_____
ACT_____
TASK_____
DATE_____ AMT $ $75.00

DISTRICT CASHIER'S USE ONLY

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

1. ☒ Major Subdivision (TM) Case No. _____
   ☐ Minor Subdivision (TPM) Case No. _____
   ☒ Major Use Permit (MUP) Case No. _____
   ☐ Purpose of MUP: to modify MUP 85-015W3 (former resort)
   ☐ Certificate of Compliance in lieu of a Tentative Map.
   ☐ Certificate of Compliance in lieu of a Parcel Map.
   ☐ Certificate of Compliance to correct a subdivision violation.
   ☐ Other _____

2. ☒ Residential . . . . . Total number of dwelling units 255
   ☐ Commercial. . . . . Gross floor area _____
   ☐ Industrial . . . . . Gross floor area _____
   ☐ Other . . . . . Gross floor area _____

3. Total Project acreage 52.0 Total number of lots 7

4. Is the project proposing 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)

505-672-03	505-672-09
505-672-10	505-672-37
505-672-07	
505-672-23	

Thomas Guide Page: _____ Grid: _____

Project Address: NW corner Sweetwater Springs and Jamacha Blvds.

Community Planning Area/Subregion: Spring Valley

Applicant's Signature: _____ Date: 8/16/15

Address: 1620 Fifth Avenue, Suite 400, San Diego, CA 92101 Phone: 619.906.4352

(On completion of above, present to the water district with appropriate fee to establish facility commitment, Section B below.)

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

Pursuant to the Public Facility Element of the General Plan and County Board of Supervisors Policy I-84, commitment must be for a period of at least two years. Commitment must be obtained within the three months prior to the date of final action by the approving authority. This is a commitment that the facilities will be available to deliver water; however, this is not a commitment regarding the availability of the water itself.

District name: Otay Water District Service area: Water I.D. 20

☐ Amount of capacity committed for this project: _____ EDUs.

☐ Facility capacity has been committed pursuant to a binding agreement satisfactory to the district. Expiration date: _____ (Commitment must be for a minimum of two years. If no expiration date, please so specify.)

☒ Facility capacity is committed for this project until 8/16/2017. (Termination date of this letter must be at least two years from the date of issuance.)

☐ The District Board of Directors has certified that public agency facilities are under construction and permits to construct have been received. Capacity for this project is committed for a period of at least two years from the time that the public agency's facility improvements come on-line.
Scheduled (not guaranteed) start-up date: _____ Capacity is committed until: _____ (if no expiration date, please so specify).

Authorized signature — Vu H. Tran *Print name*

Permit Technician — 8/18/2015 — 619-670-2241
Print title — *Date* — *Phone*

On completion of Section 2 by the District, applicant is to submit this form to:
Department of Public Works, Final Maps or Grading, 5510 Overland Avenue, Suite 310, San Diego, CA 92123

PDS-400W (Rev. 09/21/2012)

THIS APPROVAL OF AVAILABILITY
SUBJECT TO ALL OTAY WATER DISTRIC
REQUIREMENTS IN EFFECT AT THE TIME C
APPLICATION FOR SERVICE.

APPENDIX G

Proposed Sweetwater Vistas Project Plant Palette

Prepared by:
GMP Landscape Architecture and Planning

Proposed Sweetwater Vistas Plant Palette
Prepared by GMP Landscape Architecture and Planning

Botanical Name	Common Name
Community Development Landscape	
Trees	
Large canopy trees:	
Ginko biloba	Maidenhair tree
Populus fremontii	Fremont cottonwood
Quercus agrifolia	Coast live oak
Ulmus parvifolia	Chinese elm
Constrained Areas:	
Arbutus 'Marina'	Marina strawberry tree
Lagerstroemia indica	Crape myrtle
Palms:	
Archontophoenix cunninghamiana	King palm
Bismarkia nobilis	Bismark palm
Phoenix dactylifera	Date palm
Trees (general locations):	
Olea europea 'Swan Hill'	Fruitless olive
Rhus lancea	African Sumac
Tipuana tipu	Tipu tree
Tristania conferta	Brisbane box
Street trees:	
Pistacia chinensis	Chinese pistache
Trees- Sweetwater Blvd.:	
Platanus acerifolia	London Plane tree
Ulmus parvifolia	Chinese elm
Trees- Avenida Bosques/Point Parkway:	
Pistacia chinesis	Chinese pistache
Quercus agrifolia	Coast live oak
Quercus virginiana	Southern live oak

Proposed Sweetwater Vistas Plant Palette (cont.)

Botanical Name	Common Name
Community Development Landscape (continued)	
Vertical Accent Trees:	
Podocarpus 'maki'	Shrubby yew pine
Shrubs, Perennials, & Succulents	
Achillea millefolium	Yarrow
Aeonium 'Salad Bowl'	Salad Bowl aeonium
Agapanthus spp.	Lily of the Nile
Aloe Bainesii	Tree Aloe
Aloe striata	Coral aloe
Agave americana medio-picta 'Alba'	White-striped century plant
Agave attenuata	Foxtail agave
Agave 'Blue Glow'	Blue Glow agave
Agave 'Blue Flame'	Blue Flame agave
Agave parryi	Parry's agave
Agave shawii	Shaw's agave
Agave villmoriniana	Octopus agave
Arbutus unedo	Dwarf strawberry tree
Bergenia crassifolia	Winter flowering bergenia
Carissa macrocarpa	Natal plum
Chondropetalum tectorum	Small cape rush
Cistus spp.,	Rock rose
Dietes iridiodies	Fortnight lily
Dudleya pulverulenta	Live forever
Echeveria 'Afterglow'	Afterglow Echeveria
Euphorbia tirucalli 'Sticks on Fire'	Red pencil tree
Galvezia specios	Island snapdragon
Heuchera maxima	Coral bells
Hesperaloe parvifolia	Red yucca
Heteromeles arbutifolia	Toyon
Lantana montevidensis	Trailing lantana
Leonotus leonurus	Lion's tail
Leymus condensatus 'Canyon Prince'	Canyon Prince wild rye
Ligustrum texanum	Texas privet
Limonium perezii	Sea lavender
Kniphofia uvaria	Red hot poker
Perovskia atriplicifolia	Russian sage

Proposed Sweetwater Vistas Plant Palette (cont.)

Botanical Name	Common Name
Community Development Landscape (continued)	
Phormium 'Black Adder'	Black New Zealand flax
Phormium 'Maori Maiden'	New Zealand flax
Phormium 'Yellow Wave'	New Zealand flax
Pittosporum tobira	Japanese mock orange
Pittosporum tobira 'Wheeler's Dwarf'	Wheeler's Dwarf Japanese mock orange
Prunus ilicifolia 'lyonii'	Catalina cherry
Rhaphiolepis indica 'Majestic Beauty'	Majestic Beauty Indian hawthorne
Sansevieria trifasciata	Snake plant
Santolina virens	Green santolina
Senecio vitalis	Narrowleaf chalk sticks
Stachys byzantina	Lamb's ears
Teucrium fruiticans	Bush germander
Westringia fruticosa 'Dwarf Mundi'	Dwarf Coast rosemary
Yucca recurvifolia	Soft leaf yucca
Groundcovers	
Agrostis pallens (sod)	Native bent grass
Baccharis pilularis 'Twin Peaks'	Dwarf coyote brush
Ceanothus 'Yankee Point'	Yankee Point California lilac
Gallardia grandiflora	Blanket flower
Lantana 'New Gold'	New Gold lantana
Senecio mandraliscae	Blue chalksticks
Satureja douglasii	Yerba buena
Trachelospermum jasminoides	Star jasmine
Vines	
Clematis ligusticifolia	Western white clematis
Distictis buccinatoria	Red trumpet vine
Macfadyena unguis-cat	Cat's claw
Vitis californica	California wild grape
Bioretention Zones	
Artemisia douglasiana	Douglas mugwort
Carex tumulicola	Berkeley sedge
Chondropetalum tectorum	Small cape rush
Iva hayesiana	Poverty weed
Juncus patens	California grey rush
Leymus condensatus 'canyon prince'	Canyon prince wild rye

Proposed Sweetwater Vistas Plant Palette (cont.)

Botanical Name	Common Name
Bioretention Zones (continued)	
Platnus racemosa	California sycamore
Slope Plantings	
Trees:	
Populus fremontii	Fremont cottonwood
Quercus agrifolia	Coast live oak
Quercus dumosa	Scrub oak
Shrubs:	
Agave americana 'Medio Picta Alba'	White striped century plant
Agave parryi	Parry's agave
Agave shawii	Shaw's agave
Ceanothus spp.	California lilac
Cistus spp.	Rock rose
Groundcover:	
Baccharis pilularis 'Twin Peaks'	Dwarf Coyote Bush

Brush Management Zone 1 Plants

The following Zone 1 planting list is also suitable for all slopes, street plantings, and community development plantings.

Trees:	
Quercus agrifolia	Coast live oak
Quercus dumosa	Scrub oak
Shrubs:	
Achillea millefolium	Yarrow
Agave shawii	Shaw's agave
Ceanothus 'Yankee Point'	Yankee Point California lilac
Encelia californica	Bush sunflower
Festuca californica	California fescue
Lotus scoparius	Deerweed
Opuntia littoralis	Coastal pricklypear
Penstemon centranthifolius	Scarlet Buglar
Viguiera lacinata	San Diego sunflower
Yucca whipplei	Our Lord's Candle

Proposed Sweetwater Vistas Plant Palette (cont.)

Botanical Name	Common Name
Brush Management Zone 1 Plants (continued)	
Groundcover:	
Baccharis pilularis 'Twin Peaks'	Dwarf Coyote Bush
Iva hayesiana	Poverty weed
Irrrigated Native Hydroseed Mix	
Encelia californica	Bush sunflower
Eschscholzia californica	California poppy
Helianthemum scoparium	Peak sun rose
Lotus scoparius	Deerweed
Lupinus bicolor	Lupine
Lupinus succulentus	Arroyo lupine
Mimulus aurantiacus var. puniceus	Red monkeyflower
Mimulus cardinalis	Scarlet monkeyflower
Phacelia parryi	Parry's phacelia
Stipa pulchra	Purple needle grass
Vulpia mycrostachys	Vulpia

APPENDIX H

Prohibited 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

** San Diego County native species

References: Gordon, H. White, T.C. 1994. Ecological Guide to Southern California Chaparral Plant Series. Cleveland National Forest.

Willis, E. 1997. San Diego County Fire Chief's Association. Wildland/Urban Interface Development Standards

City of Oceanside, California. 1995. Vegetation Management. Landscape Development Manual. Community Services Department, Engineering Division.

City of Vista, California 1997. Undesirable Plants. Section 18.56.999. Landscaping Design, Development and Maintenance Standards.

www.bewaterwise.com. 2004. Fire-resistant California Friendly Plants.

www.ucfpl.ucop.edu. 2004. University of California, Berkeley, Forest Products Laboratory, College of Natural Resources. Defensible Space Landscaping in the Urban/Wildland Interface. A Compilation of Fire Performance Ratings of Residential Landscape Plants.

County of Los Angeles Fire Department. 1998. Fuel Modification Plan Guidelines. Appendix I, Undesirable Plant List, and Appendix II, Undesirable Plant List.