Fire Protection Plan

Otay Ranch
Village 14 and Planning Areas 16/19

Specific Plan Amendment – Appendix 2
December 2019

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FIRE PROTECTION PLANNING TECHNICAL MEMORANDUM

Prepared for:	Mr. Greg Mattson, Project Manager, County of San Diego
Prepared by:	Michael Huff, Dudek Principal Fire Protection Planner
Subject:	Fire Protection Plan Technical Memorandum for the Otay Ranch Village 14 and Planning Areas 16/19 Proposed Project Amendment
Date:	December 2, 2019
Attachment(s):	Attachment A, Memorandums Addressing Otay Ranch Village 14 and Planning Areas 16/19 Response to Comments After Approved Project FPP Attachment B, Updated Fire Protection Plan Figures 4, 7a, 7b and Appendices G, J, and L.

Introduction

This Memorandum reflects proposed changes to the Otay Ranch Village 14 and Planning Areas 16/19 Project that was approved by the San Diego County Board of Supervisors on June 26, 2019 (Approved Project). The changes to the Approved Project would reconfigure the development footprint to consolidate development in Village 14; add 147 units, for a total of 1,266 residential units; and reduce impacts by approximately 230 acres, to 579 acres (the Proposed Project Amendment). Figure 1, Regional Location Map, shows the regional location of the Approved Project Area and the Proposed Project Amendment Project Area, in the County of San Diego (County).

An Environmental Impact Report (EIR) was prepared for the Approved Project and was certified by the Board on June 26, 2019. The Final EIR analyzed the potential impacts of the Approved Project. The Final EIR also analyzed potential impacts associated with the EIR Land Exchange Alternative, which was one of the alternatives to the Approved Project. The Final EIR is incorporated herein by reference and the results are summarized in Section 3 and project design features are described in Section 5.

Dudek prepared the following Fire Protection Plans for the Final EIR, which are incorporated herein by reference:

- Final EIR Appendix 3.1.1-2, Otay Ranch Village 14 and Planning Areas 16/19 Fire Protection Plan with Appendices, dated September 2018
- Final EIR Appendix 4.1-1C, Otay Ranch Village 14 and Planning Areas 16/19 Land Exchange EIR Alternative Fire Protection Plan, dated February 2018.

Additionally, public concerns regarding projects built in Very High Fire Hazard Severity Zones have been addressed on the record and are attached herein as they are applicable to the Proposed Project Addendum. These concerns follow common

themes of: ignition resistant structures, ember cast, elevated human-caused ignitions, and evacuation. Dudek prepared four memorandums as listed below and provided in Attachment A to address these concerns.

- Dudek, 2019. "Otay Ranch Village 14 Fire Services Operational Assessment – September 2017 Rohde & Associates." Memorandum from M. Huff (Dudek) to D. Hubbard (Gatzke Dillon & Ballance LLP). June 21, 2019.
- Dudek, 2019. "Otay Ranch Village 14 and Planning Areas 16 and 19 Public Comment– Evacuation Plan Purpose." Memorandum from M. Huff (Dudek) to D. Hubbard (Gatzke Dillon & Ballance LLP). June 21, 2019.
- Dudek, 2019. "Otay Ranch Village 14 and Planning Areas 16/19 - Ignition Resistant Construction." Memorandum from M. Huff (Dudek) to D. Hubbard (Gatzke Dillon & Ballance LLP). June 24, 2019.
- Dudek, 2019. "Otay Ranch Village 14 and Planning Areas 16/19 – Center for Biological Diversity, Chaparral Institute and Preserve Wild Santee." Memorandum from M. Huff (Dudek) to D. Hubbard (Gatzke Dillon & Ballance LLP). June 25, 2019.

The Final EIR analyzed the Approved Project's potential impacts to fire service and fire hazards in Sections 3.1, Hazards and Hazardous Materials, and Section 3.1.8, Public Services. This Fire Technical Memorandum was prepared for the Proposed Project Amendment. The purpose of this analysis is to evaluate whether, and to what extent, the potential impacts of the Proposed Project Amendment to fire service and fire hazards differ from those of the Approved Project. This technical memorandum includes the following sections: (1) background, (2) Proposed Project Amendment description, (3) summary of the Approved Project's impacts to fire service and fire hazards, (4) analysis of the Proposed Project Amendment's impacts to fire service and fire hazards, (5) project design features, and (6) conclusion.

For additional context, the following terminology is used in this Technical Memorandum.

Terminology

Approved Project: The project described in Otay Ranch Village 14 and Planning Areas 16/19 Tentative Map 5616, Specific Plan 16-002, and the certified EIR, which the County of San Diego (County) approved on June 26, 2019. The Approved Project permits 1,119 residential units within a Project Area of approximately 1,369 acres. The Development Footprint of the Approved Project is 809 acres.

Conserved Open Space: Conserved Open Space refers to 24.5 acres of land within the Project Area, which, while designated in the Otay Ranch General Development Plan/Otay Subregional Plan (Otay Ranch GDP/SRP) for residential uses within Village 14 and Planning Areas 16/19, will not be developed as part of the Proposed Project Amendment. Instead, the Conserved Open Space will be preserved on site and be (a) added to the Otay Ranch Resource Management Plan (RMP) Preserve (through a future RMP Amendment), (b) managed under a separate RMP, or (c) utilized to mitigate impacts to the City of San Diego Multiple Species Conservation Program Cornerstone Lands. The Conserved Open Space areas are located adjacent to Otay Ranch RMP Preserve and will be conserved by recording a biological open space easement over the land.

Development Footprint: The areas where a given project will cause permanent or temporary ground disturbance. The Development Footprint includes all on-site development, off-site improvements, and impacts resulting from infrastructure and other allowable uses within the Otay Ranch Resource Management Plan (RMP) Preserve.

EIR Land Exchange Alternative: The project alternative identified as the "Land Exchange Alternative" in Chapter 4 of the certified Final EIR. This Land Exchange Alternative contemplated a land exchange with the California Department of Fish and Wildlife (CDFW) and would develop 1,530 residential units within a Project Area of approximately 2,387.6 acres, with a Development Footprint of 658.3 acres.

Off-Site Improvements: Off-site improvements total approximately 40.1 acres and include Proctor Valley Road, wet and dry utilities, drainage facilities, trails, an off-site sewer pump station in the southern reach of Proctor Valley Road, and off-site sewer facilities to connect to the Salt Creek Interceptor as planned since 1994.

Project Area: The total land area for the Proposed Project Amendment as contemplated in the proposed land exchange between applicant and CDFW.[1] The Project Area consists of approximately 1,283.6 acres currently owned by GDCI Proctor Valley, L.P., the owner/applicant, 219.4 acres currently owned by CDFW, and approximately 40.1 acres of off-site improvements, for a total of 1,543 acres.

Proposed Project Amendment: The Proposed Project Amendment reflects proposed changes to the Approved Project, which would add 147 units for a total of 1,266 residential units and would reduce the Development Footprint by approximately 230 acres, to a total of 579 acres, within a Project Area of 1,543 acres, as shown on Figure 2, Site Utilization Plan, and more fully described below in Section 2. The Proposed Project Amendment includes a Revised Tentative Map and Specific Plan Amendment. As contemplated in the Dispute Resolution Agreement, the Proposed Project Amendment assumes and will require a County-initiated amendment to the MSCP County Subarea

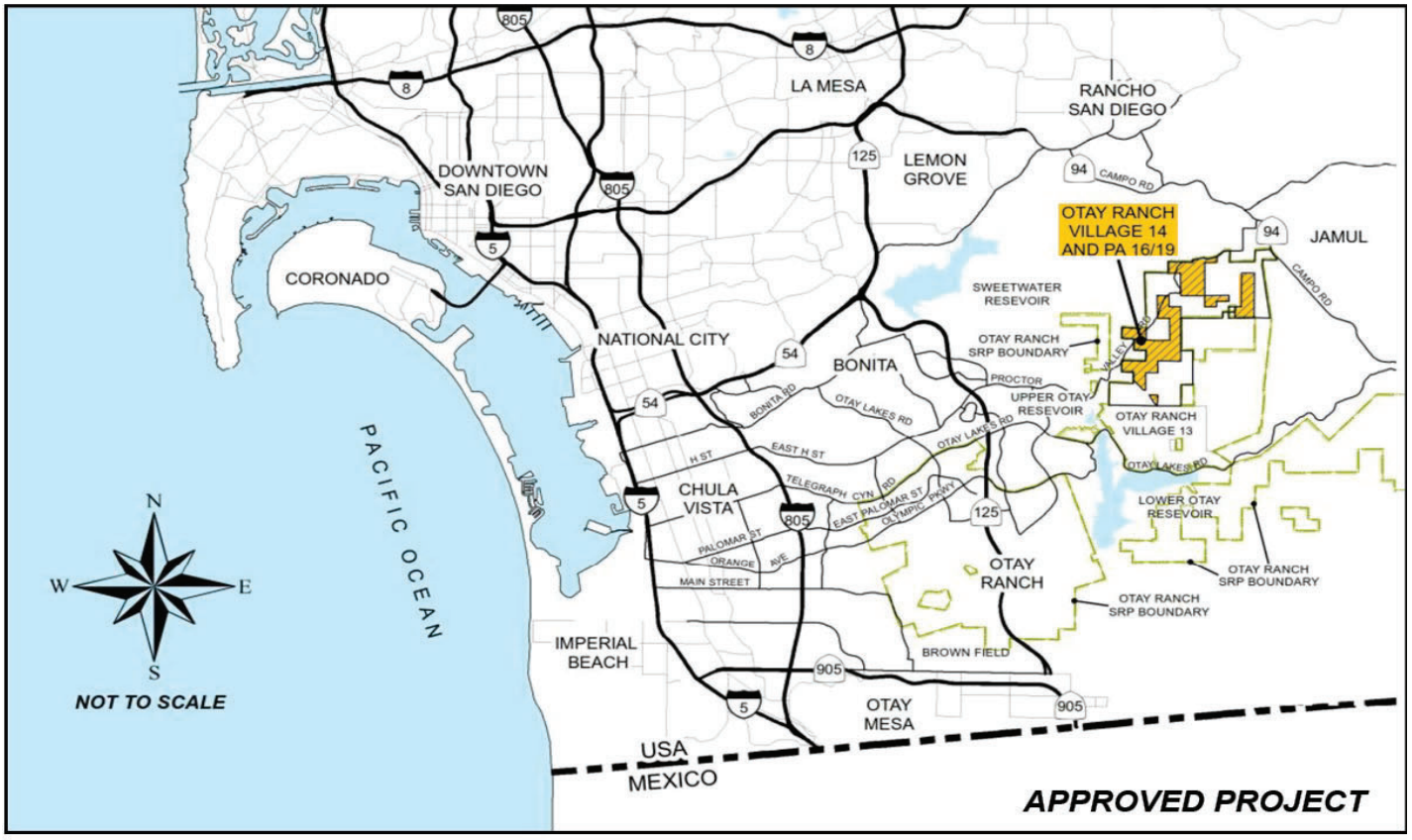
[1] As indicated above, the land exchange necessary to implement the Proposed Project Amendment must be approved by the California Wildlife Conservation Board.

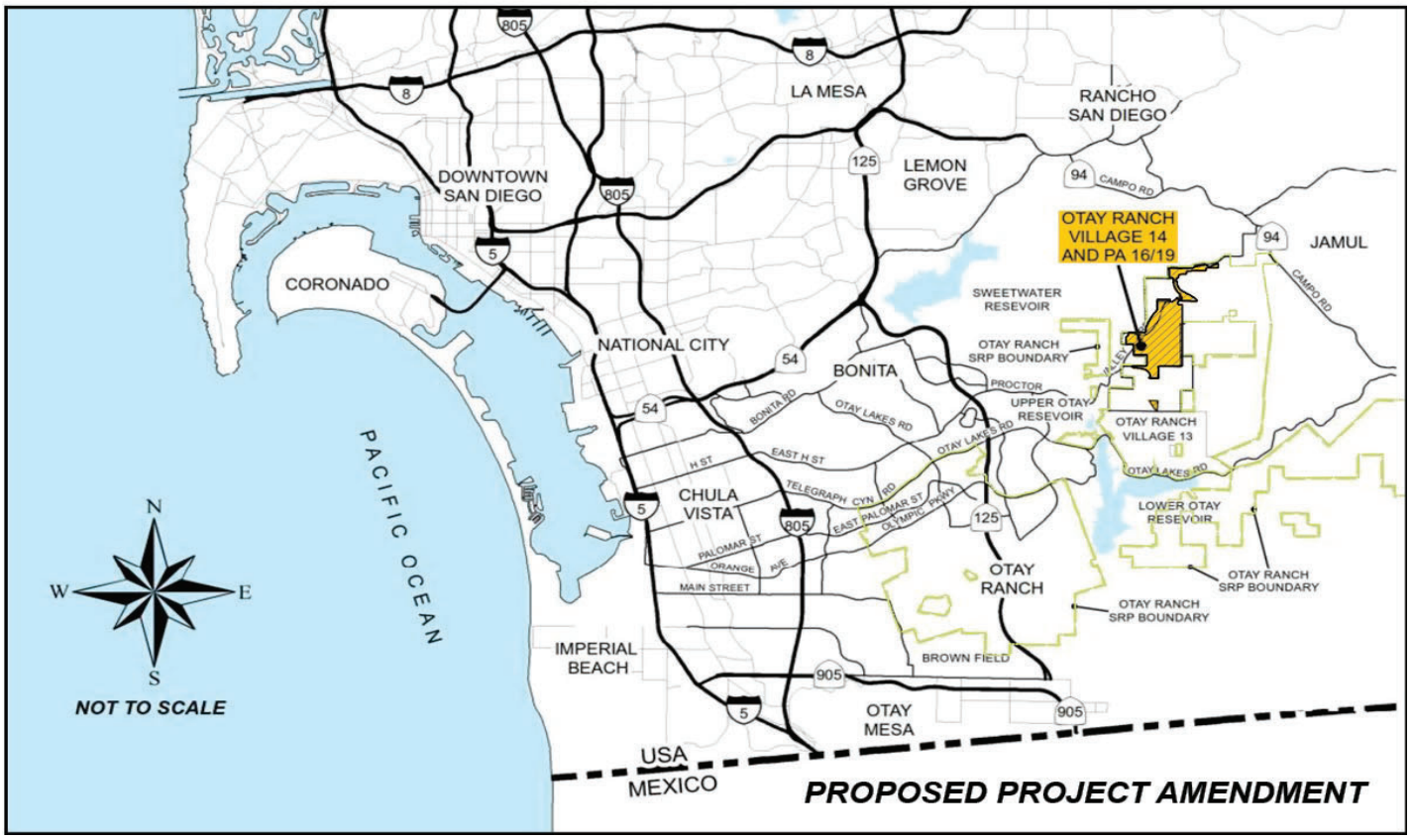
Plan. Because the amendment to the MSCP County Subarea Plan will be initiated by the County, it is not part of the Proposed Project Amendment.

PV1 and PV3: PV1 and PV3 are areas of the Approved Project located in Village 14 as shown on Figure 3.

Revised Tentative Map: The Revised Tentative Map reflects revisions to the June 26, 2019, Approved Tentative Map #5616 that are necessary to process and implement the land exchange with CDFW and the Proposed Project Amendment in the County.

Specific Plan Amendment: The Specific Plan Amendment reflects revisions to the June 26, 2019, Approved Specific Plan #16-002 that are necessary to process and implement the land exchange with CDFW and the Proposed Project Amendment in the County.





SOURCE: Hunsaker 2019

FIGURE 1

Regional Location

Otay Ranch Village 14 and Planning Areas 16/19 Proposed Project Amendment

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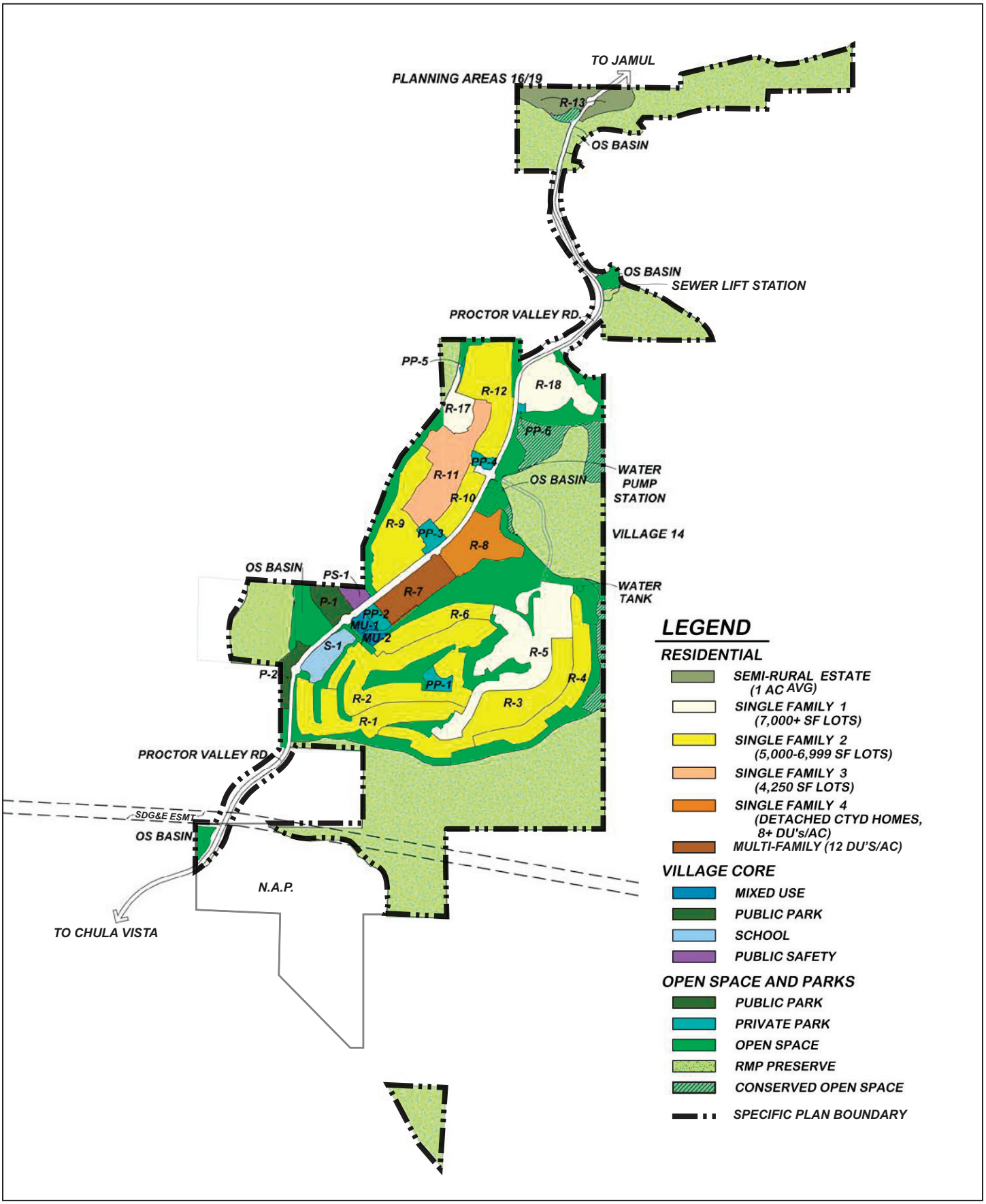

SOURCE: Hunsaker 2019

FIGURE 2

Site Utilization Plan

Otay Ranch Village 14 and Planning Areas 16/19 Proposed Project Amendment

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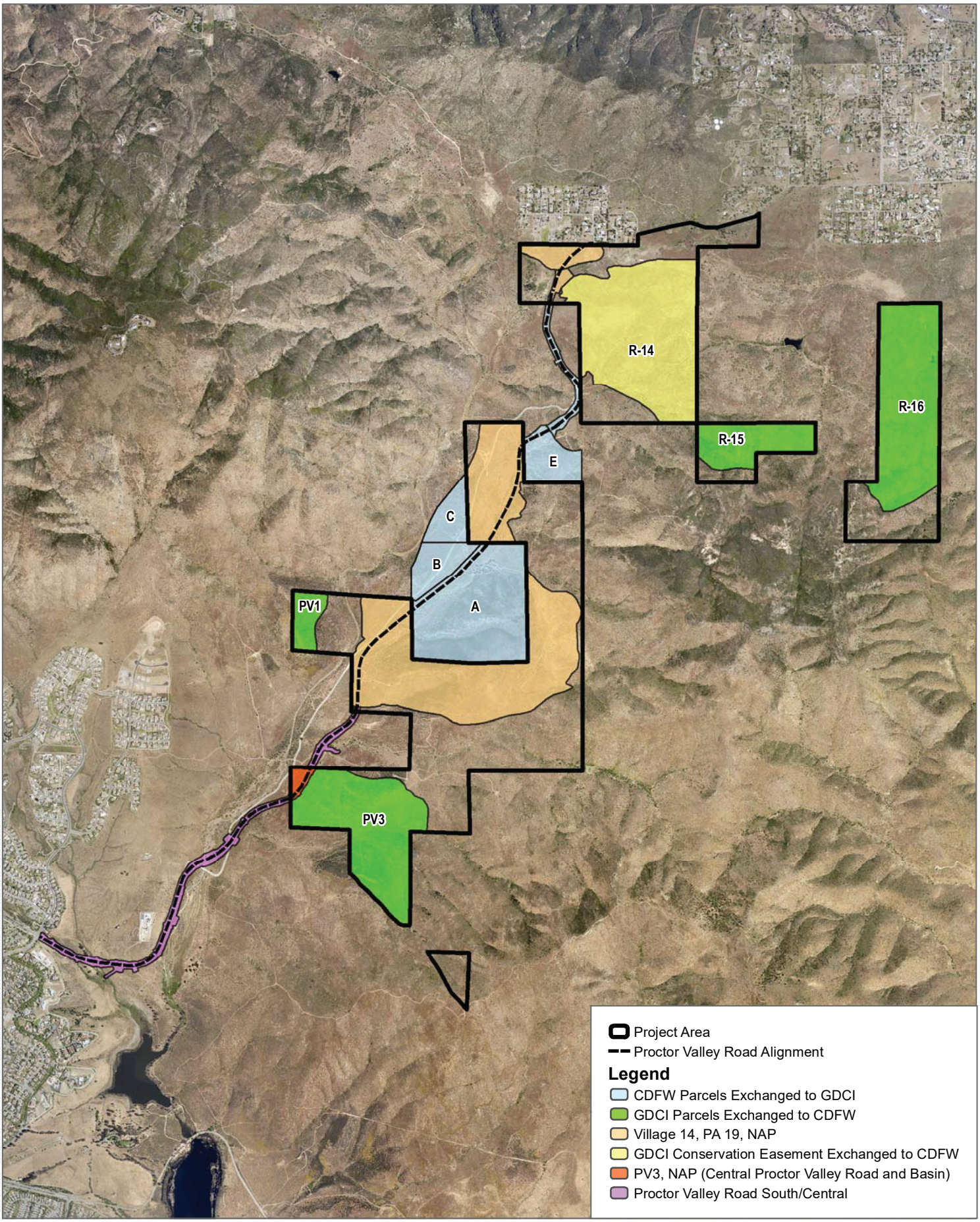


SOURCE: SANGIS 2017; Hunsaker 2019

DUDEK

0 1,400 2,800 Feet

FIGURE 3

Proposed Land Exchange

Otay Ranch Village 14 and Planning Areas 16/19 Proposed Project Amendment

Section 1. Background

The Proposed Project Amendment Project Area comprises approximately 1,543 acres of undeveloped land within the Proctor Valley area of the 23,000-acre Otay Ranch master planned community (see Figure 4, Proposed Project Amendment Project Area). The Proposed Project Amendment reflects proposed changes to the Approved Project, including a proposed land exchange with the California Department of Fish and Wildlife (CDFW).

On June 27, 2019, the owner/applicant of the Approved Project entered into a Dispute Resolution Agreement with CDFW, the U.S. Fish and Wildlife Service, and the County. Pursuant to this agreement, the owner/applicant would seek a land exchange with CDFW through a process overseen by the California Wildlife Conservation Board. The proposed land exchange, if approved by the Wildlife Conservation Board, would require the owner/applicant to (i) transfer 147.3 acres in Village 14 and 192.4 acres in Planning Area 16 to CDFW, and (ii) record a conservation easement over 191.5 acres in Planning Area 16. In exchange, CDFW would transfer 219.4 acres in Village 14 to the owner/applicant. The Proposed Project Amendment would then be implemented upon the lands within the applicant's ownership, including those received via the Wildlife Conservation Board land exchange. Because the Proposed Project Amendment assumes the above-described land exchange, it would result in a different development footprint than the Approved Project's development footprint. Therefore, a Specific Plan Amendment to the approved Village 14 and Planning Areas 16/19 Specific Plan and a Revised Tentative Map are required processes for the Proposed Project Amendment.

While the Proposed Project Amendment and EIR Land Exchange Alternative both contemplate exchanges of land with the CDFW, the Development Footprints and other aspects differ. It is important to note that the Development Footprint of the Proposed Project Amendment was assessed in the certified Final EIR as part of the Approved Project Development Footprint and as part of the EIR Land Exchange Alternative Development Footprint.

Section 2.Proposed Project Amendment Description and Summary of Amendment/Revisions

The Proposed Project Amendment proposes 1,266 residential units within a Project Area of 1,543 acres. The Proposed Project Amendment Development Footprint would be approximately 578.6 acres, which would consistent of approximately 513.1 acres within Otay Ranch Village 14, 25.2 acres within Otay Ranch Planning Area 19, and 40.1 acres of off-site improvements (i.e., Proctor Valley Road). Of the 1,266 residential units, 1,253 units would be located in Village 14 (consistent with the Otay Ranch GDP/SRP) and 13 units would be located in Planning Area 19 (consistent with the Otay Ranch GDP/SRP). The Proposed Project Amendment is depicted in Figure 2 and summarized in Tables 1 through 3.

As described above, the Proposed Project Amendment would also include a land exchange between the owner/applicant and CDFW, which would require the owner/applicant to transfer 339.7 acres to CDFW and record a conservation easement over 191.5 acres, and, in exchange, CDFW would transfer 219.4 acres in Village 14 to the owner/applicant to create a consolidated Development Footprint. The proposed land exchange between the applicant and CDFW is depicted in Figure 3. As defined above, the Proposed Project Amendment requires a Specific Plan Amendment and Revised Tentative Map, which must be approved by the County. The Revised Tentative Map would replace that certain approved Tentative Map TM #5616, approved by the County on June 26, 2019. The Specific Plan Amendment would amend the Specific Plan 16-002 to reflect the Proposed Project Amendment, including the Revised Tentative Map and the land exchange with CDFW.

Table 1. Village 14 and Planning Areas 16/19 Proposed Project Amendment Site Utilization Plan Summary

Description	Village 14		Planning Area 16/19		Total Proposed Project Amendment	
	Gross Acres	Units	Gross Acres	Units	Gross Acres	Units
Residential Subtotal (1)	**386.6**	**1,253**	**14.9**	**13**	**401.4**	**1,266**
Non-Residential Uses						
Mixed Use (2)	2.7				2.7	
Public Parks	10.2				10.2	
Private Parks/Recreation (3)	9.5				9.5	
Public Safety Site	2.3				2.3	
Elementary School Site	9.9				9.9	
Open Space	47.8		1.7		49.5	
Conserved Open Space	23.0		1.5		24.5	
Otay Ranch RMP Preserve	278.6		98.4		377.0	
Circulation	23.3		3.4		26.7	
Non-Residential Uses Subtotal	*407.2*		*105.0*		*512.1*	-
Total Proposed Project Amendment 4	**793.7**	**1,253**	**119.8**	**13**	**913.6**	**1,266**
Other Off-sites						
Off-site Improvements	40.1				40.1	
Off-site Preserve PA 16			58.2		58.2	
Parcels Exchanged to CDFW	147.3		192.4		339.7	
Conservation Easement PA 16			191.5		191.5	
Total Proposed Project Amendment Area					**1,543.1**	**1,266**

Notes: PA = Planning Area, CDFW = California Department of Fish and Wildlife.

1 Residential gross acres includes 96.7 acres of related internal slopes, fuel modification and/or preserve edge open space lots.

2 Village 14 Mixed Use acreage includes 10,000 sf of commercial use.

3 Village 14 has 2.1 acres of private pocket parks included in the residential acreage; therefore, the subtotal including PPP is 11.7 acres.

4 Totals may not sum due to rounding

Table 2. Proposed Project Amendment Site Utilization Plan Detail (Village 14)

Description		Gross Acres (1,2)	Units (3)	Density
Single Family Residential				
R-1	50*100	33.1	103	3.1
R-2	60*100	48.3	136	2.8
R-3	60*85	35.8	112	3.1
R-4	60*100	31.5	73	2.3
R-5	75*100	51.7	121	2.3
R-6	60*85	22.5	47	2.1
R-8	Courtyard	21.1	116	5.5
R-9	60*85	33.0	96	2.9
R-10	60*85	8.5	31	3.7
R-11	50*85	25.4	119	4.7
R-12	50*100	27.6	94	3.4
R-17	70*100	7.4	10	1.4
R-18	70*100	27.8	45	1.6
Single Family Residential Subtotal		*373.8*	*1,103*	*3.0*
Multi-Family				
R-7	MF	12.7	150	11.8
MF Subtotal		*12.7*	*150*	*11.8*
Residential Subtotal (3)(4)		**386.6**	**1,253**	**3.2**
Non-Residential Uses				
Mixed Use (2)	MU - C	2.7		
Public Parks				
P-1	Village Green Park	6.2		
P-2	Scenic Park	3.9		
Public Parks Subtotal		*10.2*		
Private Parks & Recreation				
PP-1	Central	2.8		
PP-2	Village Core	2.1		
PP-3	West	1.9		
PP-4	West	1.5		
PP-5	Northwest	0.8		
PP-6	Northeast	0.4		
PPP (3)	Various	0.0		
Private Parks/Recreation Subtotal		*9.5*		
Public Safety Site		2.3		
Elementary School Site		9.9		
Open Space		47.8		

Table 2. Proposed Project Amendment Site Utilization Plan Detail (Village 14)

Description		Gross Acres (1,2)	Units (3)	Density
Conserved Open Space		23.0		
Otay Ranch RMP Preserve		274.9		
Circulation - In Preserve		3.7		
Circulation – Arterial		23.3		
Non-Residential Uses Subtotal		*407.2*		
Village 14 Subtotal		**793.7**	**1,253**	**1.6**

Notes:
1 Residential gross acres includes 96.5 acres of related internal slopes, fuel modification and/or preserve edge open space lots.
2 Village 14 Mixed Use acreage includes 10,000 sf of commercial use.
3 Village 14 has 2.1 acres of private pocket parks included in the residential acreage; therefore, the subtotal including PPP is 11.6 acres.
4 Totals may not sum due to rounding

Table 3. Proposed Project Amendment Site Utilization Plan Detail (Planning Areas 16/19)

Description	Gross Acres	Units	Density
Residential Uses			
R-13 (PA 19 Estates)	14.9	13	0.9
Residential Subtotal (1)	*14.9*	*13*	*0.9*
Non-Residential Uses			
Circulation in Preserve	1.4		
Open Space	1.7		
Conserved Open Space	1.5		
Otay Ranch RMP Preserve	97.0		
Circulation Arterial	3.4		
Non-Residential Uses Subtotal	*105.0*		
Planning Area 19 Subtotal	*119.8*	*13*	*0.1*
Proposed Project Amendment Total (2)	**913.6**	**1,266**	**1.4**
OTHER			
Description	**Gross Acres (1)**	**Target Units**	**Density**
Other Applicant Owned NAP of TM			
PV1 exchanged to CDFW	18.9		
PV3 exchanged to CDFW	128.4		
R-15 Exchanged to CDFW	49.9		
R-16 Exchanged to CDFW	142.5		
R-14 Conservation Easement Area	191.5		
R-15 Preserve	10.5		
R-16 Preserve	47.8		
Subtotal	*589.5*		

Table 3. Proposed Project Amendment Site Utilization Plan Detail (Planning Areas 16/19)

Off-site Acres	40.1		
Proposed Project Amendment Project Area	1,543.1	1,266	

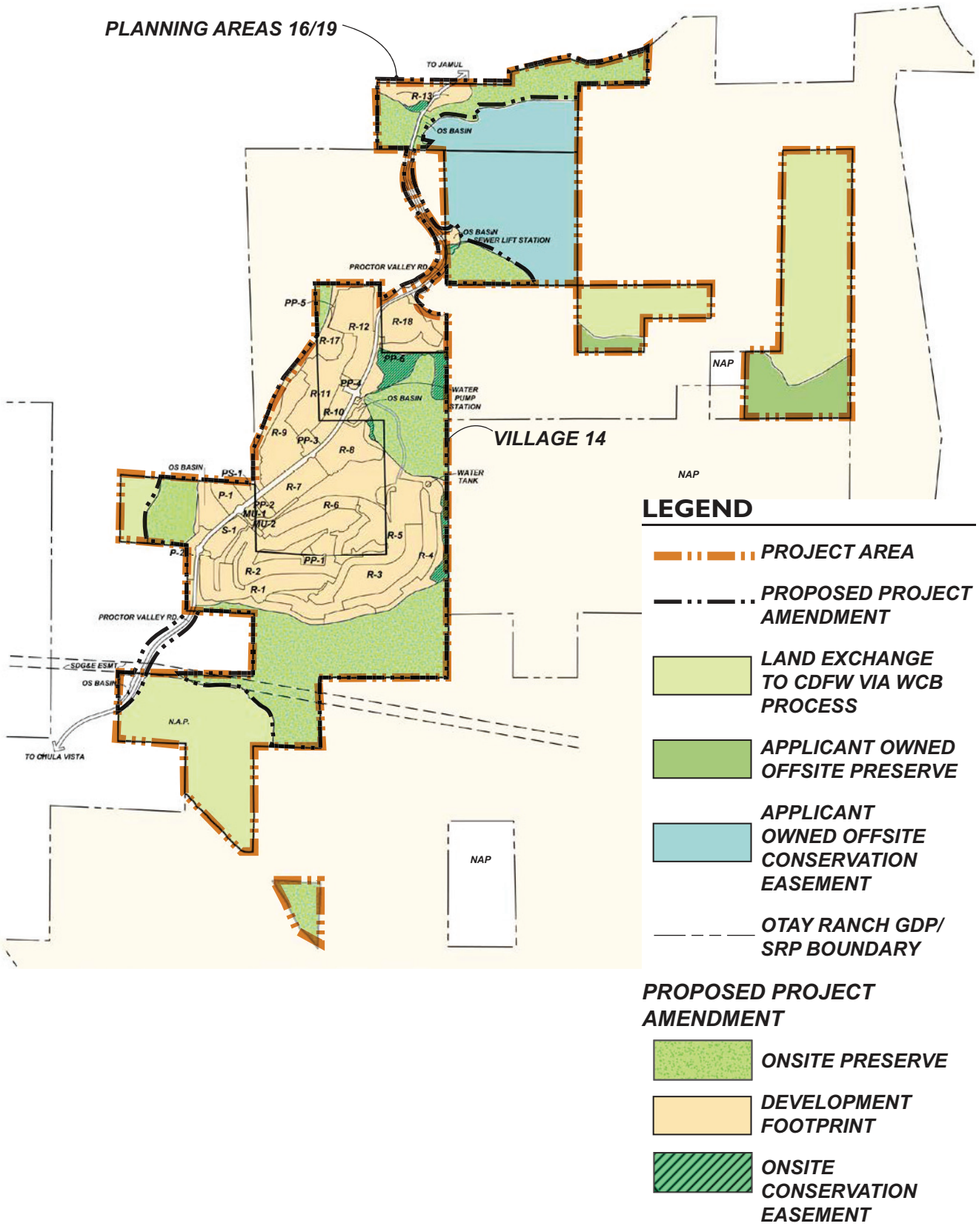
Notes: PA = Planning Area.
1 Residential gross acres includes 2.1 acres of related internal slopes, fuel modification and/or preserve edge open space lots.
2 Totals may not sum due to rounding

Proposed Project Amendment Relative to the Approved Project and the EIR Land Exchange Alternative.

The Final EIR evaluated both the Approved Project and the EIR Land Exchange Alternative at a project level of analysis. This Technical Memorandum examines whether the Final EIR, through its analysis of the Approved Project and the EIR Land Exchange Alternative, covered all anticipated impacts of the Proposed Project Amendment. Figure 5 depicts the limits of the development contemplated under the Approved Project, the EIR Land Exchange Alternative, and the Proposed Project Amendment. Table 4 provides a summary of the components for the Proposed Project Amendment, the Approved Project, and the EIR Land Exchange Alternative. Note that from a geographical perspective, each acre that comprises the Proposed Project Amendment's Development Footprint is located either within the Approved Project Development Footprint or within the EIR Land Exchange Alternative Development Footprint. In other words, no portion of the Proposed Project Amendment Development Footprint is outside the combined Approved Project and EIR Land Exchange Alternative Development Footprints.

Table 4. Proposed Project Amendment Comparison to Approved Project and EIR Land Exchange Alternative

Description	Proposed Project Amendment	Approved Project	EIR Land Exchange Alternative
Development Footprint (Acres)	579	809	658
Project Area (Acres)	1,543	1,369	2,388
Off-sites (Acres)	40	85	40
Units	1,266	1,119	1,530
Proctor Valley Rd.	Same	Same	Same



SOURCE: Hunsaker 2019

FIGURE 4

Project Area

Otay Ranch Village 14 and Planning Areas 16/19 Proposed Project Amendment

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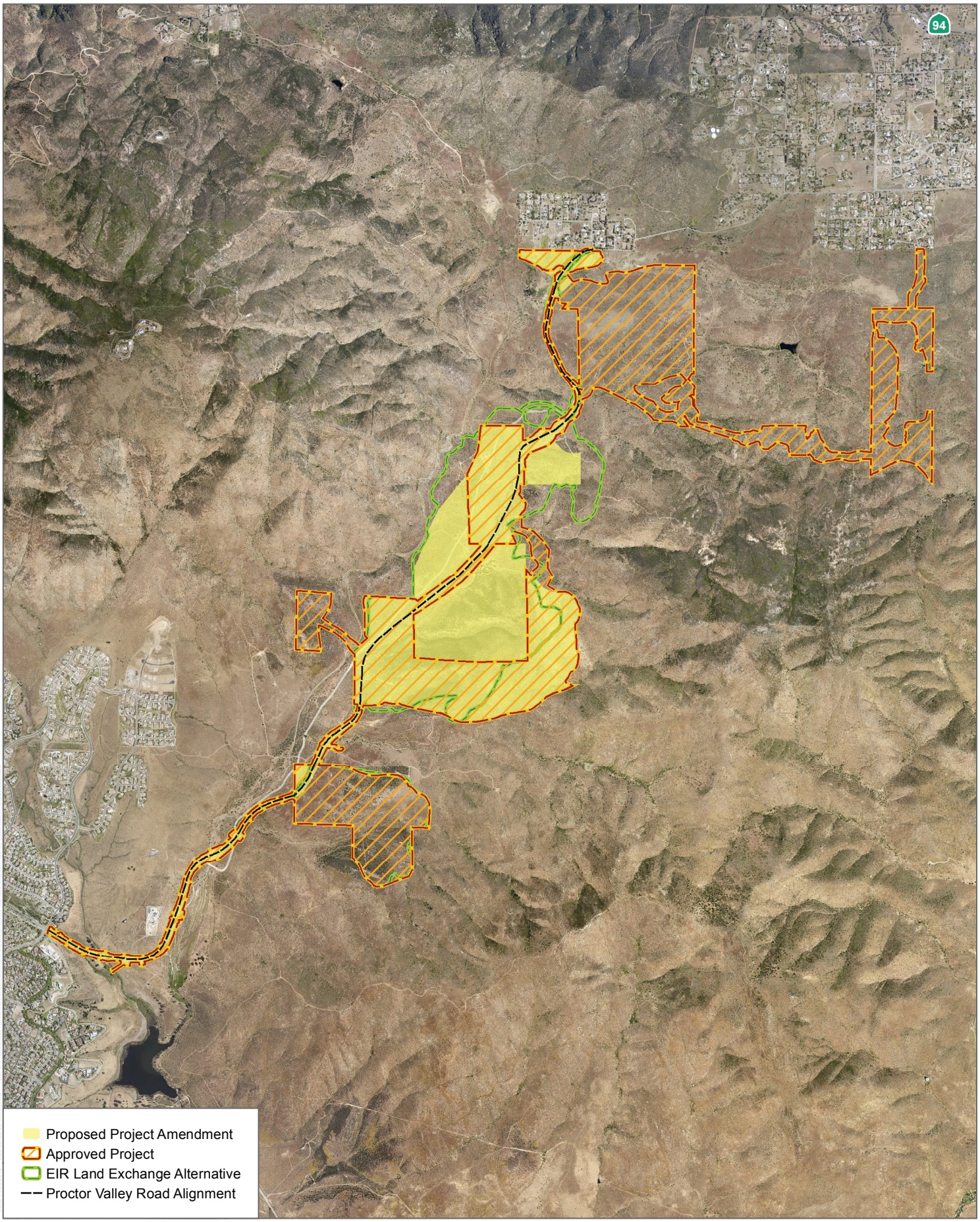

SOURCE: SANGIS 2017; Hunsaker 2019

DUDEK

0 1,450 2,900 Feet

FIGURE 5

Certified EIR Study Area

Otay Ranch Village 14 and Planning Areas 16/19 Proposed Project Amendment

Section 3. Approved Project Certified Environmental Impact Report Impacts

For the purpose of this Proposed Project Amendment, the County's Guidelines for Determining Significance: Wildland Fire and Fire Protection (County of San Diego 2010) applies to the direct and indirect impact analysis and the cumulative impact analysis.

An affirmative response to, or confirmation of, any one of the following guidelines would generally be considered a significant impact related to wildland fire and fire protection as a result of a project, in the absence of evidence to the contrary (County of San Diego 2010):

- A comprehensive Fire Protection Plan (FPP) has been accepted, and the project is inconsistent with its recommendations.
- The project does not meet the emergency response objectives identified in the Public Facilities Element of the County General Plan or offer feasible alternatives that achieve comparable emergency response objectives.
- The project cannot demonstrate compliance with all applicable fire codes.

With respect to the first threshold, the Final EIR determined that the Approved Project FPP complies with the requirements of the 2017 County Consolidated Fire Code and the 2016 California Fire and Building Codes. The recommendations in the Approved Project FPP meet fire safety, building design elements, infrastructure, fuel management/modification, and landscaping recommendations of the applicable codes. The recommendations provided in the FPP were made for the structures within a wildland/urban interface area. The recommendations included the following measures.

1. A Construction Fire Prevention Plan will be prepared, detailing the important construction-phase restrictions and fire safety requirements to be implemented to reduce risk of ignitions and plans for responding to any potential ignitions.
2. Proposed Project buildings will be constructed of ignition-resistant materials based on the latest building and fire codes.
3. Fuel modification zones (FMZs) will be provided throughout the perimeter of the Project Area and will be up to 120 feet wide in most locations, including the rear yard areas, as part of the modified zone. Maintenance will occur as needed, and the homeowner's association (HOA) will annually hire a third-party, San Diego County Fire Authority (SDCFA) approved FMZ inspector to provide annual certification that fuel modification meets the FPP requirements.
4. One-acre and larger lots (lots designated as 1, 2, or 3 acres) will include fuel modification equal to 100 feet in width from all combustible buildings of more than 250 square feet in size. The FMZ will begin at the structure and extend outward in all directions (i.e., front, sides, and rear of house). Homeowners will be responsible for maintaining the FMZs and they will be included in the annual HOA or Approved Management Entity funded third-party inspections.
5. Large lots in Planning Areas 16/19 would include limited building zones (LBZs) where the properties are adjacent to open space areas. The LBZs would designate buffer areas where no building would be allowed. If a structure is built adjacent to the LBZ, then the LBZ can be maintained as an FMZ.

6. Fire apparatus access roads would be provided throughout the community, varying in width and configuration, but would all provide at least the minimum required unobstructed travel lanes, lengths, turnouts, turnarounds, and clearances required by the applicable code.
7. Firefighting staging areas and temporary refuge areas would be available throughout the development and along roadways and Project Area green spaces so that firefighters will be able to stage operations and seek temporary refuge from wildfire, if necessary.
8. Water capacity and delivery will provide for a reliable water source for operations and during emergencies requiring extended fire flow.
9. A site-specific evacuation plan has been prepared and includes input and review from SDCFA, law enforcement, and San Diego County Office of Emergency Services.

Further, the FPP analyzed the Approved Project's impacts related to the following thresholds from CEQA Appendix G:

- Would the project expose people or structures to a significant risk of loss, injury or death involving wildland fires, including where wildland are adjacent to urbanized areas or where residences are intermixed with wildland?
- Would the project result in inadequate emergency access?
- 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?
- Would the project have sufficient water supplies available to serve the project from existing entitlements and resources, or are new or expanded entitlements needed?

When properly implemented on an ongoing basis, the Final EIR determined that fire protection strategies provided in the Approved Project FPP would significantly reduce the potential fire threat to vegetation from the Approved Project and from vegetation on the structures, and should assist the fire authority in responding to emergencies in the Approved Project Area. The Approved Project'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 and the latest ignition-resistant construction methods and materials would be used. Further, all structures are required to include interior, automatic fire sprinklers, consistent with the fire codes. Fuel modification would occur within designated FMZs and developed landscapes throughout the interior of the Approved Project. In addition, a public safety site within the Village Core would house a fire station equipped with a fire engine suited to respond to structural and vegetation fires.

With respect to the second threshold, the Final EIR determined that the fire station within the Approved Project Village Core area would ensure that the General Plan's travel time standards can be met for the Project Area. Specifically, the Final EIR analyzed the Approved Project's conformance with the Safety Element of the San Diego County General Plan, which establishes travel time standards for new development. Table S-1 of the General Plan sets a 5-minute travel time for Village (VR-2 to VR-30) and limited Semi-Rural Residential Areas (SR-0.5 and SR-1) and Development located within a Village Boundary. A 10-minute travel time applies to Semi-Rural Residential Areas (> SR-1, SR-2, and SR-4) and Development located within a Rural Village Boundary. The Final EIR determined that the Village 14 component of the Approved Project was subject to the 5-minute travel time, and the Planning Area 16/19 portions of the Approved Project were subject to the 10-minute travel time.

The Final EIR concluded that fire service will be provided by SDCFA from a centrally located, on-site station capable of responding to 96% of the Approved Project's lots, including all of Village 14, within the County General Plan's 5-minute travel time standard. Further, the Final EIR found that the existing SDCFA Station No. 36 can respond to about 1% of the Proposed Project's lots (located in Planning Areas 16/19) within 5 minutes, and the remaining lots within Planning Areas 16/19 within 6 minutes travel time, which is under the rural residential General Plan 10-minute travel time for this land use.

Lastly, with respect to code compliance, the Final EIR determined the Approved Project included additional project design features, which are listed in Table 3.1.1-2. Coupled with the project design features required by the Approved Project FPP, the inclusion of an on-site fire station, and the provision of defensible space, the overall intensity of a wildland fire would be low. Provisions for modified fuel areas separating wildland fuels from structures were found to reduce the number of fuel-related structure losses. These project design features, also included in the Approved Project FPP, are required by the latest building and fire codes, are required for new development in wildland/urban interface areas, and would form the basis of the system to provide adequate access by emergency responders and provide the protection necessary to minimize structural ignitions. Features required by 2016 California Building Code include the following:

1. Application of the latest adopted ignition-resistant building codes
2. Exterior wall coverings are to be non-combustible or ignition resistant
3. Multi-pane glazing with a minimum of one tempered pane
4. Ember-resistant vents (recommend BrandGuard, O'Hagin, or similar vents)
5. Interior, automatic fire sprinklers to code for occupancy type
6. Modern infrastructure, access roads, and water delivery system
7. Maintained FMZs
8. Fire apparatus access roads throughout the Project Area's developed areas

In addition to the code-required fire safety features, the Final EIR found that the Approved Project would provide additional features, including heat-deflecting landscape walls at strategic perimeter locations, to augment the FMZs and to provide additional perimeter protection for homes with a downslope at the edge of a rear yard (Final EIR, Appendix 3.1.1-2) (refer to Appendix L, Fire Walls exhibit [Updated]in Attachment B of this report).

Therefore, the Final EIR determined that impacts from the Approved Project related to wildfires would be less than significant.

Section 4. Proposed Project Amendment Impacts to Wildfire

Section 4.1 Code Compliance

The Proposed Project Amendment would include the application of the current 2016 California Fire Code and Chapter 7A of the 2016 California Building Code for the entire Village 14 and Planning Area 19 sites, similar to the Approved Project. Figures 4, 7a, 7b and appendices G- to G5, J, and L of the FPP (Attachment B) have been updated to display the new project design for the Proposed Project Amendment.

Section 4.2 Defensible Space

Under the Proposed Project Amendment, perimeter FMZs will primarily remain the same as the Approved Project throughout the Village 14 and Planning Area 19 neighborhoods. Similar to the Approved Project, three lots in Planning Area 19 (R-15: Lots 5, 6, and 7) and a section of the property line north of the fire station (Lot PS-1) and public park (Lot P-1) in Village 14 will be provided heat deflecting walls as part of a system of protection enhancements to compensate for potentially reduced FMZs. The Fuel Modification Zone Map (see Attachment B, FPP Appendices G1 to G5 [updated] for the Proposed Project Amendment) presents the locations of the perimeter FMZs and Attachment B, FPP Appendix L (updated) provides the locations of non-combustible walls that augment the reduced FMZs. Additionally, Street I, which connects R-5 to Proctor Valley Road, would receive 50 feet of FMZ measured on a horizontal plane from the edge of each side of the road into adjacent open space as shown on Attachment B, FPP Appendix G (updated).

Internal open space lots, including 10, 13, 14, 15, 16, 17, 19, 20, 21, 39a, 41a, 42, 43, 44, and 48 (and any other applicable open space lot) would be irrigated, planted with drought-tolerant and fire-resistant plants, and maintained annually, or as needed, by the HOA or other funded entity.

The Proposed Project Amendment designates Lot OS-22 as a FMZ Special Management Area. A FMZ Special Management Area includes those areas where native fuels will be managed such that the highly flammable prohibited species and the dead and dying plants are removed while other native plants that are less prone to ignition and fire spread are allowed to remain. This area is illustrated in Attachment B, FPP Appendix G (updated) and is a larger block of native habitat that is outside the Zone 1 and Zone 2 areas. This FMZ Special Management Area is managed consistently with the fuel modification requirements of Zone 2, because it is considered important for fire behavior reduction, occurs within otherwise developed areas, eliminates fuel island conditions, and is strategically located in terrain that would facilitate fire spread if left unmanaged. This area will be maintained on a regular basis along with Zones 1 and 2, but will focus on removal of prohibited plant species and dead and dying plant material.

Lots 14 through 26, 62 through 64, and 76 through 79 would not require 100-foot wide FMZs since Lot OS-21 would be irrigated, planted with drought-tolerant, fire-resistant plants, and routinely maintained per FPP FMZ Zone 1 criteria. Lot OS-22 would be maintained as previously described.

Section 4.3 Enhanced Defensible Space/Structure Setbacks

The Proposed Project Amendment would provide enhanced defensible space by strategically locating non-combustible walls for up to 27 perimeter lots, compared to 38 lots for the Approved Project, where structures are located at the top of a slope and abut open space. Top-of-slope setbacks of 30 feet are desirable for two-story homes. These lots provide 20 feet of setback, and the walls are provided to mitigate the reduced setback by providing a barrier in the line of fire at the top of slope. The purpose of these walls is to enhance the protection provided by the FMZs and to provide a measure consistent with meeting the intent of top-of-slope structure setbacks. This wall requirement is not required by SDCFA. Consistent with the Approved Project and the EIR Land Exchange Alternative, the Proposed Project Amendment provides this code-exceeding project feature. Attachment B, FPP Appendix L (updated) illustrates the locations of the fire walls.

Section 4.4 Emergency Response and Service

SDCFA will serve the Proposed Project Amendment, because the Project Area is in County Service Area 135, and the County has indicated that it can and would provide fire and emergency medical response. Fire service will be provided by SDCFA from a proposed, centrally located on-site station that will be capable of responding to 100% of the Proposed Project Amendment's lots (1,266 units) within the County General Plan's 5-minute travel time standard.

As indicated in Table 5, using SDCFA's estimate of 82 annual calls per 1,000 population, the Proposed Project Amendment's conservatively estimated 4,549 permanent residents (Village 14 - 1,253 units × 3.6 persons per dwelling unit = 4,511 and PA 13 – 13 units x 2.9 persons per dwelling unit = 38) and 94 staff associated with the mixed-use areas would generate approximately 381 calls per year (1.0 call per day). Of these calls, at least 70% are expected to be medical emergencies and 2.3% are expected to be fire-related calls, based on typical call volumes (Huff, pers. obs. 2017). The calculated emergency response call volume load (1.0 call per day) is consistent with the Approved Project's projected call volume.

Table 5. Calculated Call Volume Associated with Otay Ranch Village 14 and Planning Area 19

Emergency Calls per 1,000	Number of Residents, Guests, and Staff[a]	Average No. Calls per Year (4,643/1,000)x82	Avg. No. Calls per Day (381/365)
82	4,643 (estimate)	381	1.0

[a] Population estimates based on 3.6 persons per residential dwelling unit for all occupancy types.

The Village 14 component of the Proposed Project Amendment's Project Area is subject to the 5-minute travel time, and the Planning Area 19 portions of the Proposed Project Amendment are subject to the 10-minute travel time.

Table 6. Emergency Travel Times from Proposed Public Safety Site and SDCFA Station 36

5-Minute Travel Time	Quantity of Units Reached within 5 Minutes	Percentage of Residential Units Reached within 5 Minutes	Quantity of Units Reached within 10 Minutes	Percentage of Residential Units Reached within 10 Minutes
Public Safety Site	1,266	100%	N/A	N/A
SDCFA Station 36	13	1%	1,266	100%

Note: The travel time analysis considered proposed traffic-calming measures for the Proposed Project Amendment. The types of traffic calming proposed would maintain the emergency travel speeds modeled for this analysis.

As indicated in Table 6, all of the proposed development lots within Village 14 (1,253 residential units) and Planning Area 19 (13 residential units) can be reached within the most restrictive 5-minute travel time standard from the proposed on-site fire station. Providing additional coverage, the existing SDCFA Fire Station 36 can respond to approximately 1% of the Proposed Project Amendment's lots (located in Planning Area 19) within 5 minutes and the remaining Village 14 lots within the 10-minute travel time standard for semi-rural residential, Therefore, the proposed on-site fire station would ensure that the General Plan's travel time standards can be met for the Project Area.

The Proposed Project Amendment includes a significant number of new homes, a school site, and commercial structures. Service level requirements could, in the absence of fire facilities and resources improvements, cause a decline in the SDCFA

response times and capabilities. However, similar to the Approved Project, additional firefighting capabilities and resources provided by the Proposed Project Amendment, including an on-site fire station, would meet the anticipated demands.

Section 5.Final EIR Project Design Features

Based on implementation of the FPP requirements, compliance with applicable fire codes, and inclusion of a fire station in the Project Area, along with the elimination of larger lots in PA 16 and the clustering of lots within PA 14, which results in a more defensible product, the Proposed Project Amendment would not have significant impacts relating to wildfire hazards. The FPP update and its requirements for project fire safety features would be incorporated by reference into the Proposed Project's final Conditions of Approval to ensure compliance with County codes/regulations and significance standards. Additionally, the County's emergency response and multijurisdictional fire efforts will be able to provide adequate emergency response.

Based on the results of the Proposed Project Amendment analysis and findings, the fire safety features presented in Table 7 and Table 8 would be implemented in conjunction with the development of the Proposed Project. These fire safety features, which are similar to the Approved Project fire safety features, would minimize the potential exposure of the Project Area to wildfire hazards.

Table 7. Otay Ranch Village 14 and Planning Area 19 Code-Required Fire Safety Features

Approved Project			Land Exchange Alternative	Proposed Project Amendment
Feature No.	Feature Description	Conclusion	Impact(s) and Mitigation from Technical Reports	
1	**Ignition-Resistant Construction.** Proposed Project buildings would be constructed of ignition-resistant construction materials based on the latest Building and Fire Codes.	Impacts would be less than significant.	**M-BI-19** Fire Protection. To minimize the potential exposure of the Project Area to fire hazards, all features of the Project Fire Protection Plan for Otay Ranch Village 14 and Planning Areas 16/19 shall be implemented in conjunction with development of the Proposed Project.	**M-BI-19** Fire Protection – No Change
2	**Interior Fire Sprinklers.** All structures over 500 square feet would include interior fire sprinklers.	Impacts would be less than significant	**M-BI-19** Fire Protection	**M-BI-19** Fire Protection – No Change
3	**Fuel Modification Zones – Village 14.** Provided throughout the perimeter of the Development Footprint and would be up to 120 feet wide in most locations, including the rear yard areas as part of the modified zone. Maintenance would occur as needed, and the HOA would annually hire a third party, SDCFA-approved, FMZ inspector to provide annual certification that it meets the requirements of this FPP.	Impacts would be less than significant	**M-BI-19** Fire Protection	In addition to 120 feet wide FMZs, Lot OS-22 will be designated as a FMZ Special Management Area where native fuels will be managed such that the highly flammable prohibited species and the dead and dying plants are removed while other native plants that are less prone to ignition and fire spread are allowed to remain.
4	**Fuel Modification Zones – Large Lots.** One-acre and larger lots (lots designated as 1, 2, or 3 acres) would include fuel modification equal to 100 feet from all combustible buildings more than 250 square feet. The FMZs would begin at the structure and extend outward in all directions (front, sides, and rear of house). Homeowner's would be responsible for maintaining the FMZs, and they would be included in the annual HOA or approved management entity funded third-party inspections.	Impacts would be less than significant	**M-BI-19** Fire Protection	**M-BI-19** Fire Protection – No Change

Table 7. Otay Ranch Village 14 and Planning Area 19 Code-Required Fire Safety Features

Approved Project			Land Exchange Alternative	Proposed Project Amendment
Feature No.	Feature Description	Conclusion	Impact(s) and Mitigation from Technical Reports	
5	Roadside Fuel Modification Zones. Roadside FMZs would be consistent with the code for Village 14. FMZ width would be 20 feet on either side of all Proposed Project roads and 10 feet on either side along existing Proctor Valley Road. Planning Areas 16/19 would include 20-foot-wide FMZ except for connecting roads between neighborhoods, which would be 50 feet wide.	Impacts would be less than significant	**M-BI-19** Fire Protection	**M-BI-19** Fire Protection – No Change
6	**LBZ.** Large lots in Planning Areas 16/19 would include LBZs where the properties are adjacent to open space areas. The LBZs would designate buffer areas where no building would be allowed. If a structure was built adjacent to the LBZ, then the LBZ can be maintained as an FMZ.	Impacts would be less than significant	**M-BI-19** Fire Protection	**M-BI-19** Fire Protection – No Change
7	**Fire Apparatus Access.** Provided throughout the community and would vary in width and configuration, but would all provide at least the minimum required unobstructed travel lanes, lengths, turnouts, turnarounds, and clearances required by the applicable code.	Impacts would be less than significant	**M-BI-19** Fire Protection	**M-BI-19** Fire Protection – No Change
8	**Firefighting Improvements.** Firefighting staging areas and temporary refuge areas are available throughout the Proposed Project's developed areas and along roadways and HOA open space.	Impacts would be less than significant	**M-BI-19** Fire Protection	**M-BI-19** Fire Protection – No Change
9	**Water Availability**. Water capacity and delivery would provide for a reliable water source for operations and during emergencies requiring extended fire flow.	Impacts would be less than significant	**M-BI-19** Fire Protection	**M-BI-19** Fire Protection – No Change
10	**Project Area Fire Station.** Emergency response travel time consistent with the San Diego County General Plan requirement for the Proposed Project would be provided by a	Impacts would be less than significant	**M-BI-19** Fire Protection	**M-BI-19** Fire Protection – No Change

Table 7. Otay Ranch Village 14 and Planning Area 19 Code-Required Fire Safety Features

Approved Project			Land Exchange Alternative	Proposed Project Amendment
Feature No.	Feature Description	Conclusion	Impact(s) and Mitigation from Technical Reports	
	Project Area fire station. Travel times to all portions of the Project Area would be within General Plan standards, less than 5 minutes for most of the Proposed Project's developable lots and within 10 minutes for the rural residential lots in Planning Areas 16/19.			

Table 8. Otay Ranch Village 14 and Planning Area 19 Code Exceeding or Alternative Materials and Methods Fire Safety Features

Approved Project			Land Exchange Alternative	Proposed Project Amendment
Feature No.	Feature Description	Conclusion	Impact(s) and Mitigation from Technical Reports	
1	**Construction Fire Prevention Plan.** Details the important construction phase restrictions and fire safety requirements that would be implemented to reduce risk of ignitions and pre-plans for responding to an unlikely ignition.	Impacts would be less than significant.	Code Exceeding – No Change	Code Exceeding – No Change
2	**Community Evacuation Plan.** A Proposed Project-specific evacuation plan would be prepared for the Proposed Project and would include input and review with SDCFA.	Impacts would be less than significant	Code Exceeding – No Change	Code Exceeding – No Change
3	**HOA Wildfire Education and Outreach.** The Community HOA would include an outreach and educational role to coordinate with SDCFA, oversee landscape committee enforcement of fire safe landscaping, ensure fire safety measures detailed in this FPP have been implemented, and educate residents on and prepare facility-wide "Ready, Set, Go!" plans.	Impacts would be less than significant	Code Exceeding – No Change	Code Exceeding – No Change
4	Heat Deflecting Landscape Walls. Walls would be provided for 38 lots to provide additional fire protection and to enhance structure setback from top of slope. At a few locations, where FMZ is constrained to approximately 70 feet, walls would be provided as mitigation to provide same practical effect. (Alternative materials and methods for FMZ reductions in some locations. Also, a code exceeding measure as it is not required for structure setback.)	Impacts would be less than significant	Walls would be provided for 38 lots to provide additional fire protection and to enhance structure setback from top of slope. Non-combustible fire walls would be provided for 7 lots with reduced FMZ widths.	Walls would be provided for 27 lots to provide additional fire protection and to enhance structure setback from top of slope. Non-combustible fire walls would be provided for 5 lots with reduced FMZ widths.

Table 8. Otay Ranch Village 14 and Planning Area 19 Code Exceeding or Alternative Materials and Methods Fire Safety Features

Approved Project			Land Exchange Alternative	Proposed Project Amendment
Feature No.	Feature Description	Conclusion	Impact(s) and Mitigation from Technical Reports	
5	Fuel Modification Zone Third-Party Inspections. Annual FMZ and LBZ/LDA inspections would be funded by the HOA and conducted by a qualified third-party consultant to certify that the Proposed Project's FMZs are maintained and LBZ/LDA have no authorized structures.	Impacts would be less than significant	Code Exceeding – No Change	Code Exceeding – No Change
6	**Planning Areas 16/19 Roadside Fuel Modification Zones.** Roadside FMZs would be 50 feet wide on either side of the road, 30 feet wider than required, where roads traverse open areas with adjacent native fuels.	Impacts would be less than significant	Code Exceeding – No Change	Code Exceeding – No Change
7	**Planning Areas 16/19 Fuel Modification Zone Maintenance Enforcement.** The HOA would be responsible for enforcing private property maintenance of large lot FMZs in Planning Areas 16/19. These FMZ areas would also be inspected by the third-party inspector.	Impacts would be less than significant	Code Exceeding – No Change	Code Exceeding – No Change
8	**Trail Maintenance.** Provided trails would include ongoing maintenance of flammable vegetation, not including alongside trails.	Impacts would be less than significant	Code Exceeding – No Change	Code Exceeding – No Change
9	**Wider Roads and Driveway Exclusion.** In Southern Procter Valley Village, Streets "A" and "M" include wider roads and do not have driveways, enabling free traffic flow and enhanced evacuation capability.	Impacts would be less than significant	Code Exceeding – No Change	Code Exceeding – No Change

Section 6.Conclusion

The Otay Ranch Village 14 and Planning Area 16/19 Final EIR determined that impacts related to wildfire would be less than significant and would not require mitigation measures for the Approved Project. Based upon the changes proposed under the Proposed Project Amendment, no new wildfire impacts would occur and no mitigation would be required.

Section 7.References

County of San Diego. 2010. "County of San Diego Report Format and Content Requirements – Wildland Fire and Fire Protection." August 31, 2010. http://www.sdcounty.ca.gov/dplu/docs/ Fire-Report-Format.pdf.

Huff, M. 2017. Experience working in San Diego County fire jurisdictions. Personal observation by M. Huff (Dudek).

Attachment A

Memorandums Addressing Otay Ranch Village 14 and Planning Areas 16/19 Response to Comments After Approved Project FPP

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MEMORANDUM

To:	David Hubbard, Gatzke Dillon & Ballance, LLP
From:	Dudek
Subject:	Otay Ranch Village 14 and Planning Areas 16/19 Center for Biological Diversity, Chaparral Institute and Preserve Wild Santee
Date:	June 25, 2019
cc:	Liz Jackson, Jackson Pendo Development
Attachment(s):	None

Comment: The EIR's Analysis of the Project's Wildfire Risks and Impacts Is Inadequate.

Response: The comment restates those previously submitted on the DEIR and responses were provided as O-6, O-6.4, and O-6.5.

Comment: The FEIR Fails to Adequately Assess Wildfire Risk and the Potential Impacts of More Fire Ignitions from Placing Homes and People in High Fire-Prone Areas.

Response: The comment restates those previously submitted and responses were provided as O-6, O-6.4 and O-6.5. The comment references research that does not distinguish wildfire damaged homes from older, vulnerable homes and new construction with ignition resistant materials and methods and ember resistant vents. Refer also to response memorandum: Ignition Resistant Construction for information pertaining to comments regarding structure losses and ember cast.

Comment: The FEIR's Mitigation for Wildfire Impacts Is Inadequate.

Response: The comment restates those previously submitted and responses were provided as O-6, O-6.4 and O-6.5. Please refer to response memorandum: Evacuation Plan Purpose for responses to all evacuation related comments. Public outreach and education as well as ongoing maintenance are addressed in the Project's Fire Protection Plan and the Wildland Fire Evacuation Plan.

Comment: The FEIR Fails to Adequately Assess and Mitigate the Impacts to Special-status Species Due to Increased Human-caused Ignitions.

Response: The comment is speculative regarding plant community type conversion caused by Project-caused wildfires. The Project's Fire Protection Plan analyzes potential ignition sources and the Project's measures to minimize ignitions and the potential that accidental ignitions spread off the site. Due to the existing ignition sources to the north and east of the Proctor Valley and the large expanses of open space, there are considerable opportunities for wildfire that would not be significantly increased with the Project.

Comment: The FEIR Fails to Adequately Account for the Impact of Climate Change to Wildfire Risk.

Response: The comment regarding climate change effects on wildfire are speculative. Some have argued that climate change will greatly increase the potential for wildfires, but new research has shown that there will not be as significant of an impact on southern California shrublands than is anticipated in the coniferous forests of the Sierra Nevada and northern California[1]. Indeed, the researchers demonstrated that drier conditions in California's forests will certainly increase potential for large, severe fires there; in southern California shrublands, however, the impact will be significantly less, owing to the fact that region already experiences a severe annual drought. Instead, southern California's increasing population will make it more likely that ignitions will occur, which could potentially cause large areas of chaparral to type-convert into grasslands.

Comment: The FEIR Fails to Adequately Assess and Mitigate the Potential Health and Air Quality Impacts from Increased Smoke from Human-caused Ignitions.

Response: The comment is speculative regarding toxic smoke produced from burning homes. The Project's Fire Protection Plan provides details including the restrictive requirements necessary to build in wildland urban interface locations in San Diego County along with measures provided above and beyond the requirements that combine to provide a fire hardened community that will not be vulnerable to wildfires like older communities that do not have organized and funded HOAs to ensure fire safety remains at levels specified in the Fire Protection Plan. The post-development condition of the Project Area would diminish the ability of a wildfire to spread as it has historically in Proctor Valley. The Proposed Project's landscaped and irrigated areas and FMZs, as well as the paved roadways and ignition-resistant structures, would result in reduced fire intensity and spread rates around the Project Area, creating defensible space for firefighters. Additionally, provisions for a fire station in the area would reduce the response time to wildfire ignitions and increase the likelihood of successful initial attacks that limit the spread of wildfires. This fire station would also become part of the regional fire service delivery plan for the SDCFA for this portion of the county and would support fire and emergency service provision in the communities of Jamul, Dulzura, and Otay Mesa. Modern infrastructure and the latest ignition-resistant construction methods and materials would be used. Further, all structures are required to include interior, automatic fire sprinklers, consistent with the fire codes." (Final EIR, pages 3.1.1-25 to -26.)

Because the project would not result in increased significant wildfire hazards, the project would not result in increased significant project-related health impacts from exposure to wildfire smoke.

Comment: The FEIR Fails to Adequately Assess and Mitigate the Impact of Increased Wildfires on Fire Protection Services and Utilities.

Response: The Project's Fire Protection Plan acceptance, which includes details for on-site fire response resources, demonstrates that the Project provides its fair share for fire agency enhancements proportional to the demands generated by the Project. Developments like the Project provide temporary refuge locations for firefighters, break up fuel beds, and provide opportunities for fire attack that would not be possible, or would be greatly diminished otherwise.

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1 Keeley, J., and A. Syphard. 2016. Climate change and future fire regimes: examples from California. Geosciences 6:37. 14pp

Comment: The FEIR Fails to Adequately Assess and Mitigate Cumulative Wildfire Impacts.

Response: The FEIR adequately assesses and mitigates cumulative wildfire impacts. Each referenced project is required to provide a fire protection plan documenting that it meets or exceeds the strict requirements of San Diego County and where potential demands or fire response time require, each project provides for additional fire response resources. Additionally, the projects generate additional revenues for firefighting capabilities through tax allocations. The cumulative impact is mitigated through these measures to a level below significance.

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MEMORANDUM

To:	David Hubbard, Gatzke Dillon & Ballance, LLP
From:	Michael Huff
Subject:	Otay Ranch Village 14 and Planning Area 16 and 19 Public Comment – Evacuation Plan Purpose
Date:	June 21, 2019
cc:	Liz Jackson, Jackson Pendo Development
Attachment(s):	None

This memorandum responds to public comments on the purpose of the Village 14 and Planning Area 16/19 Wildland Fire Evacuation Plan (WFEP - Dudek, September 2017). In summary, evacuation plans are not required by the California Environmental Quality Act or any other regulation or policy for development projects like Village 14 and Planning Area 16/19. Despite this, the WFEP was prepared as part of the Project's cautious, fire safety planning approach. The WFEP was reviewed by SDCFA and provided comments were incorporated into the final plan.

The purpose of the Project's WFEP is focused on the following:

Resident awareness – the first several pages of the WFEP are focused on raising the awareness and readiness of the Project's residents so they are familiar with their options and the actions they may be directed to take during a wildfire emergency. This portion of the WFEP serves as the residents' quick reference guide.

San Diego County Evacuation Process – the middle portion of the WFEP focuses on providing a background and history of how San Diego County conducts evacuations, the agencies involved, and the resources they employ. San Diego County has learned from past wildfires and has responded by investing hundreds of millions of dollars to improve capabilities. These investments have resulted in arguably the most capable wildfire response system in the world.

Baseline Evacuation Calculations – The latter portion of the WFEP provides baseline calculations of the number of vehicles that may be anticipated evacuating the Project along with application of the County's Emergency Operations Plan formula for estimating the Project's evacuation travel time. This portion of the WFEP is intended for emergency managers to provide "ballpark" timeframes, should they choose to incorporate this into their pre-fire plans,

Evacuation plans are not requirements for projects and are not utilized by Emergency Management Agencies because every wildfire is unique and fluid. The WFEP prepared for the Project was not intended to model regional evacuations, and to Dudek's knowledge, there are no such plans in existence in San Diego County or California. People are evacuated based on situational awareness and measured threat. San Diego County utilizes a sophisticated system of detection, communication, monitoring, forecasting, and notification to phase evacuations based on the movement and predicted wildfire path.

The WFEP provides baseline information based on two potential evacuation scenarios and focuses on resident awareness. Evacuation plans for communities and regions at large are the function and purview of the Office of Emergency Services, law enforcement agencies, fire agencies, and the unified command established during emergencies.

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MEMORANDUM

To:	David Hubbard, Gatzke Dillon & Ballance, LLP
From:	Michael Huff
Subject:	Otay Ranch Village 14 Fire Services Operational Assessment – September 2017 Rohde & Associates
Date:	June 21, 2019
cc:	Liz Jackson, Jackson Pendo Development
Attachment(s):	None

Dudek received a copy of the September 2017 Draft Rohde & Associates Fire Services Operational Assessment for Otay Ranch Village 14 (Rohde Report) in June 2019. The Rohde Report was commissioned by San Diego County Fire Authority (SDCFA), and was completed and submitted to the SDCFA approximately five months prior to Dudek's Village 14 and Planning Areas 16/19 Fire Protection Plan (FPP) completion and the same month Dudek completed the Wildland Fire Evacuation Plan. The San Diego County Fire Authority (SDCFA) has reviewed the Proposed Project's Fire Protection Plan and Wildland Fire Evacuation Plan and accepted these Plans on February 5, 2018.

The Rohde Report provides an operational fire safety and response perspective whereas the Dudek reports provide a summary of the Project's compliance with regulatory requirements. Both are valuable documents, but their purposes are unique. The operational assessment is appropriate for use by emergency managers and responders while the regulatory document is appropriate for determining whether a project deviates from fire safety requirements or is not consistent with CEQA thresholds.

The Rohde Report indicates concurrence with the Dudek FPP and Evacuation Plan on all technical aspects including: site characterization, fuel condition mapping, fire behavior modeling, evacuation timeframes, fire department response times, the list of planned fire mitigating features and the majority of the fuel modification zone (FMZ) requirements.

The Rohde Report suggests that trigger points be considered for determining when to halt evacuations and consider contingency options. The Dudek Wildland Fire Evacuation Plan does not include this operational feature as it is not appropriate for a regulatory planning document, but is appropriate for an operational planning document. The trigger points are valid and are recommended for consideration by the emergency management agencies in their pre-fire planning process.

The Rohde Report suggests that 38 lots are planned for heat deflecting landscape walls, including two lots in Planning Area 16 along with certain lots in Planning Area 19 due to reduced FMZ. This is inaccurate as the Dudek FPP indicates that there are two lots in PA 16 and depending on the final positioning of the fire station, there may be a reduction to no less than 70 feet of the FMZ adjacent to that property. The 38 additional lots that receive a heat deflecting landscape wall are provided this additional protection due to their positioning on their respective pads as a conservative fire safety measure, but they also receive a full 100 feet of managed FMZ.

Regarding the two lots in PA 16 and the potential fire station site FMZ reductions, Dudek provides substantial justification and proposed mitigations for the reduced FMZ areas.

Finally, the Rohde report suggests that for portions of the north and east flanks of PA 16 and 19, it would recommend wider FMZs of 150 to 200 feet based on their exposures at the outer edges of the Project. However, the FPP evaluated the fuels, terrain, and wind alignments and determined that under extreme conditions, the 100 feet minimum FMZs, combined with the other FPP and fire code requirements for building in the fire hazard severity zone would be acceptable protection. SDCFA reviewed and agreed with this conclusion.

Regarding fire protection for the Project, including FMZ, access, road details, water, and related fire protection Project attributes, Dudek and County staff met with SDCFA on numerous occasions, both before and after the draft Rohde Report to review the project and address any revisions. For example the following features resulted from the ongoing discussions:

- Limited Building Zones were added to the Tentative Map in Planning Area 16.
- FMZ's in Planning Area 16/19 in the FPP are "interim" at the back of the graded lots and may be modified by SDCFA (such as requiring wider FMZ) at building permit issuance with specific requirements (See FPP Sections 6.1.1 Fuel Modification Zones in Planning Areas 16/19). This is because the homes are on estate lots and will not be sited on the lots until building permits and a site plan are submitted to the County.
- Wider roadway FMZs were added to Planning Area 16.
- Fuel modification was provided in Limited Development Areas (See Bio Conditions).

Dudek engaged the SDCFA several times to discuss the limited areas of reduced FMZ, including one meeting in late January/early February 2018 at the SDCFA and including County planners and the Fire Marshal and Deputy Fire Marshal. These meetings/communications included discussion of the fuels, fire behavior modeling results, and appropriate mitigations. Among the important topics discussed were: where fuel modification reductions are proposed, the irrigated zone has been extended and a non-combustible wall separating structures from off-site fuels added.

Dudek identified eight code-exceeding or Alternative Material or Method Measures for the Proposed Project, i.e. measures that are above what is required by code (See Table 8 FPP). SDCFA agreed that the proposed mitigations would provide equivalent structure protection. In sum, SDCFA and Dudek worked together through the screencheck review process to address SDCFA concerns, resulting in acceptance of the Plans in February 2018.

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MEMORANDUM

To:	David Hubbard, Gatzke Dillon & Ballance, LLP
From:	Dudek
Subject:	Otay Ranch Village 14 and Planning Areas 16/19 Ignition Resistant Construction
Date:	June 24, 2019
cc:	Liz Jackson, Jackson Pendo Development
Attachment(s):	None

Comment: New Structures Vulnerable to Fire

The comment references several articles regarding ignition resistant building codes and their ineffectiveness at preventing structures from igniting. This cursory analysis suggests that many homes built after adoption of the 2008 wildfire standards were lost during these fires (particularly the Camp Fire). However, without knowing the specific details of each home (e.g., maintenance practices, proximity to other building, position on the landscape, fuel modification provisions, etc.), these statistics can be misleading[1]. The statistics cited are likely valid regarding the percentages of newer homes (built after 2008) that were damaged during the various wildfires, however, the referenced articles and all of the submitted comments related to structure loss are ignoring the most significant wildfire related structure loss factor - embers. Embers are referenced within some of the articles (eg. "Here's How Paradise Became a Deathtrap" and "New Houses Built to Fire Code, burned down anyway in Southern California's 2017 Thomas Fire") but are largely ignored in the provided comments. Embers have been and continue to be the most important factor for loss of structures in wildland fires[2].

Despite the latest ignition resistant provisions in the County Building and Fire Codes, the issue of ember penetration is not fully addressed. The code has partially addressed the issue by requiring vent mesh with smaller openings, but this has not proven effective. To that end, Village 14 and Planning Area 16 and 19's structures are required by the Project's Fire Protection Plan (Dudek 2018) to include ember resistant vents, such as Brandguard and/or O'Hagin vents that are designed and tested to prevent ember penetration through a series of internal baffles that capture embers.

Fire protection is a system of features that work together to address wildfire threats. The system includes hardened structures, but also the ignition resistant landscapes, available water, fire department access and fast response, as well as ongoing maintenance. The system requires careful planning and design, implementation, and ongoing maintenance. Homeowner's Associations (HOAs) are very good conduits for ensuring that the required fire protection features are maintained as intended. Many homes that were lost in recent wildfires to direct flame

[1] Y. Valachovic, University of California Cooperative Extension. What can we learn from the 14,000 homes lost during the Camp Fire? https://ucanr.edu/blogs/blogcore/postdetail.cfm?postnum=29026

[2] National Fire Protection Association. Preparing Homes for Wildfire. https://www.nfpa.org/Public-Education/By-topic/Wildfire/Preparing-homes-for-wildfire

impingement likely did not include the rigorous fuel modification areas that are planned for Village 14 and Planning Areas 16 and 19. These zones will be maintained by the HOA and inspected by a 3rd party every year to ensure that they meet the strict FPP requirements that would not facilitate fire spread into the community's neighborhoods.

An important factor for structure protection is defensible space. Although Paradise and other California cities affected by wildfire had similar defensible space regulations as Village 14 and Planning Areas 16 and 19 (minus extended zones, ongoing funded maintenance, and 3rd party inspections), local authorities there did not seem to regularly enforce these regulations (Figure 1), which is unfortunately common in areas that do not have a funded HOA and in areas where the fire agency does not have the capacity to enforce defensible space regulations. The high degree of near-structure vegetation in Paradise, which was prevalent throughout the community before the 2018 Camp Fire, would have readily ignited the adjacent structures once they started burning.

All that said, the most granular level of fuels to consider (the homes themselves) served as the most important fuel that led to the mass devastation in Paradise, Coffee Park, and elsewhere. Indeed, throughout those communities, home after home was destroyed, but the adjacent vegetation was left largely untouched (Figure 2). This phenomenon has been observed in virtually every large, destructive wildfire, including the 2007 Witch Creek Fire in San Diego County, the 2009 Black Saturday Fires in Victoria, Australia, the 2017 Tubbs Fire in Santa Rosa, and the 2018 Woolsey Fire in Los Angeles County. In all cases, mass destruction in many parts of the fire boundary was largely related to homes igniting via an ember storm, which burned many homes from the inside out following embers entering the structure via vents, roof crevices, windows, under doors, etc.

Structures in Village 14 and Planning Areas 16 and 19 have been designed to prevent ember intrusion through application of the latest building codes and an important vent requirement that exceeds the code. In the most simplistic perspective possible, if a home does not ignite, it will not burn. To combat structural ignition, the State and County of San Diego have enacted stringent building codes to resist ignition during a wildfire, including County Building Code (Title 9, Division 2, Chapter 1 of the San Diego County Code of Regulatory Ordinances) and the Consolidated County Fire Code, and Chapter 7A of the California Building Code. These standards address structural features susceptible to ignition, including:

1. Roofs
2. Exterior walls
3. Vents
4. Eaves
5. Projections such as decks, exterior balconies, etc.
6. Windows and other transparent openings such as a sun roof
7. Fences within 5-ft of the structure
8. Rain gutters
9. Exterior doors
10. Window screening
11. Setbacks of structures from slopes

Figure 1. Fuels in Paradise that facilitated wildfire movement toward non-ignition resistant homes.

Figure 2. Paradise Fire, similar to many other fires where structures burn from the inside out due to ember penetration while surrounding vegetation is left largely intact.

All homes in the Project will adhere to the stringent County Building Codes, thus restricting structural features that are susceptible to ignition and installing ember resistant vents, addressing the most vulnerable structural feature. The vast majority of homes in Paradise, however, were built before 1970, almost 40 years before California enacted building codes to resist ignition during a wildfire. A non-technical observation from one UC researcher indicated that the very few homes left standing in Paradise were of newer construction, built to the new ignition- resistant building standards that resist both radiant heat and (perhaps more importantly) exposure to embers[3].

Specific to San Diego County, one study[4] found that the three greatest factors determining home survival in Ramona and Rancho Santa Fe during the 2007 Witch Creek Fire were age of construction (which influences the potential for ignition-resistant building materials), presence of vegetation within 5' of a given building (which influences potential for flame impingement on the structure), and distance from native vegetation (which influences the potential amount of ember exposure). Pertinent to the Project, the study demonstrated that development of ignition-resistant homes with proper defensible space can actually reduce the potential loss of older homes that are moved away from the wildlands because they begin to shelter the older, ignition-prone homes from exposure to flames, heat, and embers.

San Diego County learned valuable lessons during the destructive 2003 fire season, which burned over 5,000 structures. In those fires, homes that were built under 2001 building codes survived at a rate three times greater than homes built before the codes were strengthened[5]. Following the 2003 fires, the County has enacted a series of even more restrictive building codes meant to protect a home during a wildfire.

The County is at the cutting edge of fire protection, a position that it was forced to pursue following devastating wildfires in 2003 (Cedar Fire) and 2007 (Witch Creek Fire), along with other smaller, yet important wildfires. Following the Cedar Fire, the County began a multi-pronged approach to fire protection that included significant investments in firefighting resources (air attack, apparatus, staffing, facilities, emergency alert system, and pre-planning), but equally as important, the County conducted post-fire save and loss assessments. These assessments were vital to understanding the factors leading to home survivability.

Additionally, the County created a comprehensive fire protection planning approach that requires each project to be evaluated by a qualified fire protection planner/firm, to document the project's fire risk, code compliance, and to disclose if any condition is not code compliant, and provide appropriate mitigations and features that provide appropriate, site based risk mitigation. The County has spent in excess of $500 million toward fire suppression, fuel reduction, planning, communications, and emergency response, and has had multiple, successfully managed wildfire events to engage the pre-fire plans, learn from the process, and adjust practices. Although the wildfire threat remains, particularly where old homes abut natural vegetation, the County is far safer today than it was 20 years ago because newer structures and planned communities (built to the latest codes) are designed to resist ignition, even during significant wildfire threats.

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3 Y. Valachovic, University of California Cooperative Extension. What can we learn from the 14,000 homes lost during the Camp Fire? https://ucanr.edu/blogs/blogcore/postdetail.cfm?postnum=29026

4 Morais, N.C., C.A. Dicus, and D. Sapsis. In review. Changing fire risk over time across three communities in southern California.

5 County of San Diego, Planning & Development Services, Wildland -Urban Interface Building Division <https:// www.sandiegocounty.gov/pds/docs/pds664.pdf>

Other developments in southern California that have been designed to resist wildfires have shown similar rates of significantly lowered loss when exposed to wildfire, including the 4S Ranch in San Diego County, Stevenson's Ranch in Santa Clarita, Serrano Heights in Orange County, and others. All of these communities were built with heightened requirements for fire safety, including hardened buildings, protected roofs, vent protections, maintained fuel modification zones, and others, all of which will be employed by the Project.

In contrast to San Diego County, wildfires have also occurred in an around Paradise and Santa Rosa (sometimes returning to the exact same areas), but little was done to reduce risk of structural loss there. Indeed, the 2017 Tubbs Fire followed in almost exact same footprint as the 1964 Hanley Fire; what differed from 1964 and 2017 was the amount of fire-prone homes that were built in the area. Had these homes been built with fire-resistant materials such as required by Chapter 7A of the California Building Code and with code-exceeding vents, it is highly unlikely that the level of devastation would have been the same. Similarly, 13 significant wildfires occurred in the last 20 years around the community of Paradise, yet there seemed to be little mitigation to reduce the risk there; when the 2018 Camp fire ignited under extreme weather conditions, a massive ember storm easily ignited older homes, which then caused a chain reaction of structure-to-structure ignitions.

While San Diego County has been incredibly progressive in their attempts to reduce wildfire losses (especially following the 2003 fire siege), the sites recently impacted in northern California did not seem to take their fire risk as seriously. For example, CAL FIRE reportedly warned Paradise as early as 2005 that the community was at risk of a devastating conflagration similar to that experienced in the 1991 Oakland Hills Fire, which killed 25 and destroyed 2,900 structures[6].

Ignition Reductions

Wildfires in areas near Village 14 and Planning Areas 16 and 19, and throughout San Diego County and California, are almost always human-induced. Efforts to reduce risk of ignition within the Project include undergrounding powerlines, which would effectively eliminate a potential ignition source. Further, roadside clearance is planned within the community and along Proctor Valley Road, which will reduce the risk of wildfire ignition from vehicles (via glowing catalytic converter debris, sparks from dragging chains, etc.).

Many of the destructive fires in the region (and also the recent devastating fires in Santa Rosa and Paradise) were ignited by powerlines. Of note, however, San Diego Gas & Electric has recently taken a very aggressive approach at restricting ignitions via their powerlines, becoming one of the most progressive utilities in the world at closely monitoring conditions that might facilitate ignitions and rapid fire spread, and then taking appropriate steps to minimize fire starts, including shutting down the electrical grid during extreme fire weather conditions in areas deemed to be potentially vulnerable to ignition. Further, the California Public Utilities Commission, as of February 6, 2019, now requires all energy companies in California to prepare comprehensive Wildfire Mitigation Plans. These plans are detailed assessments and accountings of the risk drivers and the risk reduction measures that are being employed for each facility, including electrical transmission and distribution lines.

[6] St. John, P., J. Serna, and L. Rong-Gong II. 2018. Here's how Paradise ignored warnings and became a deathtrap. Los Angeles Times, 30-Dec.

Comment: Evacuation Plan Intent and Proctor Valley Road as Evacuation Route

Comments submitted generally question the Wildland Fire Evacuation Plan prepared for the Village 14 and Planning Area 16 and 19 Project (Project), the breadth of its scope and lack of regional view, the project-specific approach, and the resulting travel time estimates. Please refer to the Dudek response memorandum titled Otay Ranch Village 14 and Planning Area 16 and 19 Public Comment – Evacuation Plan Purpose for details regarding the evacuation plan, its purpose, relevancy, and intended use.

Regarding the Project's ability to evacuate on Proctor Valley Road, it is important to note that the Project meets all applicable fire code requirements for access including dead end road lengths and secondary access within each neighborhood and for the Project cumulatively. In addition, road improvements will be provided to Proctor Valley Road and include providing for a Code-consistent 24-foot wide, two lane, paved road (currently extensive gravel sections) meeting County requirements for the entirely of PVR, both north and south of the Project. Roadside fuel modification will also be provided.

The Project would also construct two planned roundabouts along Proctor Valley Road. The roundabouts are designed to include uninterrupted travel ways. Various studies indicate that there may be some slowing of fire engines (1.7 to 10 seconds) when compared to a traditional intersection, but even if this delay occurred, it is not considered significant in terms of fire response. The roundabouts are designed to facilitate movement of larger vehicles including fire engines, delivery vehicles, and large pick-ups with livestock trailers without causing traffic congestion. Per Federal Highway Administration Publication No. FHWA-14-098:

- Roundabouts are designed for safety and efficiency of all users and can actually improve emergency response times by eliminating/minimizing stops and delays.
- Roundabouts are safer than intersections, even when signals are fitted with preemption devices.
- Emergency vehicles slow down to pass through intersections similarly to slowing down to proceed through a roundabout.
- Roundabouts accommodate larger vehicles and often include rolled curbs and truck aprons for rear wheels

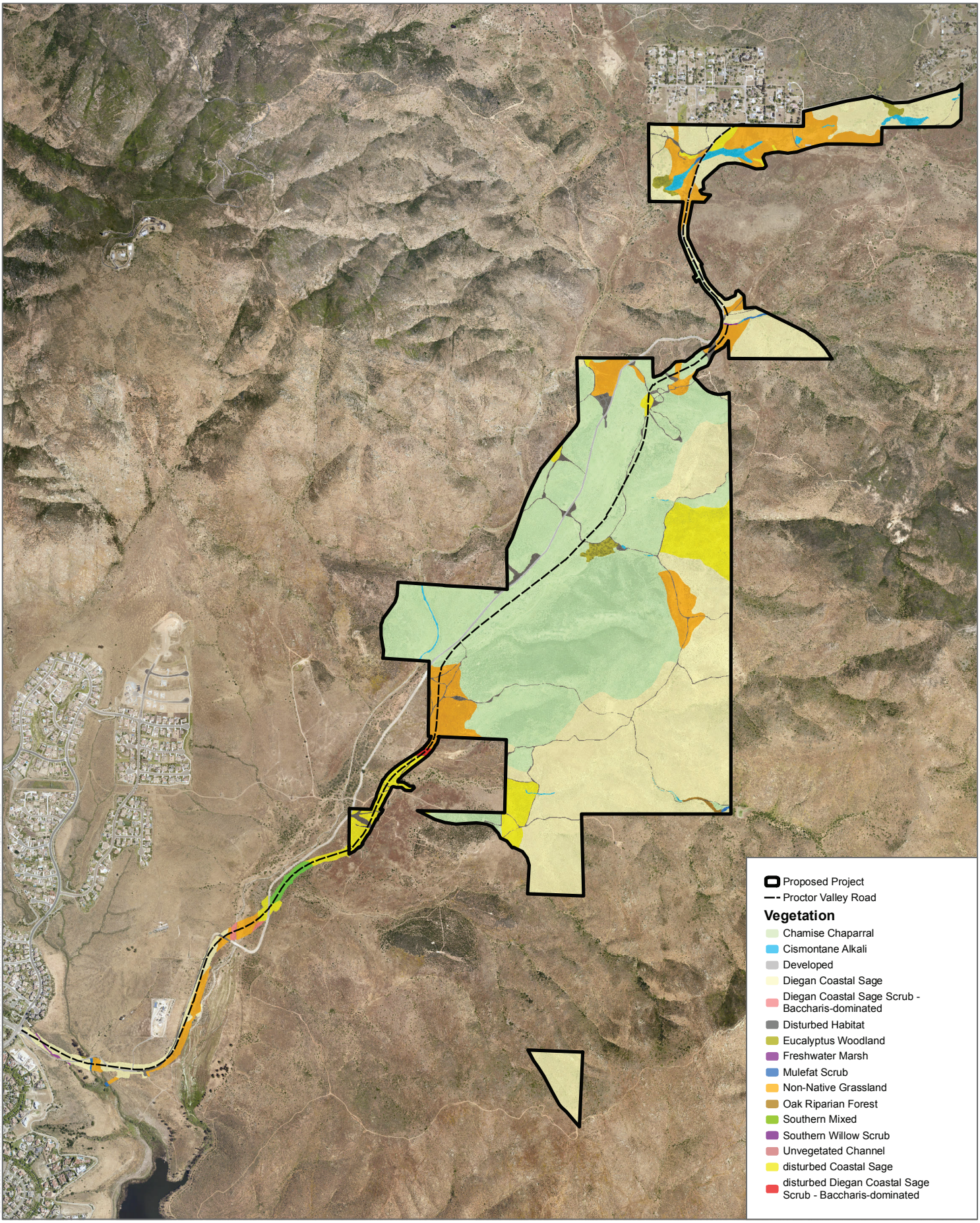
A focused Evacuation Route Study was prepared by Fehr & Peers traffic consultants (2012) for Jamul/Dulzura. The study evaluated existing conditions and potential enhancements and new routes, ranking them based on a variety of attributes. The study contemplated only one potential evacuation enhancement related to Proctor Valley Road. The potential route that would connect Campo Road with Proctor Valley Road was not ranked high enough for inclusion in the final routes for recommended implementation. This analysis suggests that Proctor Valley Road is not considered a high priority evacuation route for Jamul/Dulzura, according to Fehr & Peers' analysis. Based on its existing condition, washboard gravel road with short paved sections, it would not be consistent with a key evacuation route. Following the Project related improvements, Proctor Valley Road would meet the requirements for an evacuation route as well as have a large, ignition resistant temporary refuge (Village 14) along the evacuation route, providing an improved evacuation condition versus the existing condition.

Regional Evacuations

Evacuation of the Project's residents and the existing community would follow procedures identified by the San Diego County Emergency Operations Plan, Evacuation Annex. Evacuations are fluid and evacuation decisions are made based on situational awareness. It is virtually impossible to pre-plan an wildfire evacuation because wildfire movement is unpredictable. Instead, San Diego County emergency managers rely on a proven process that includes a sophisticated system of on-the ground resources, high tech sensors, real-time fire progression modeling, powerful communications capabilities, significant personnel resources, and a robust alert system. This system has evolved since 2003 and has become a very effective and efficient evacuation protocol, as evidenced by the most recent 2017 Lilac Fire, where evacuations occurred on a phased basis to minimize road congestion and move people at highest risk. San Diego County Sheriff's Department confidently states that they can move large numbers of people during wildfire emergencies. This is accomplished through downstream intersection control, which SDCSD has stated would be implemented in evacuation events. For additional understanding of SDCSD's stated management capabilities of large scale, mass evacuations in North San Diego County, see SDCSD Captain Brown's testimony during the Harmony Village Grove South Planning Commission Hearing on May 24, 2018 (Minute 4'37" at the following link, https://media.avcaptureall.com/session.html?sessionid=aa0c1020-3c05-41aa-8df8-35402343f4ce&prefilter=240,2901.

Attachment B

Updated Fire Protection Plan Figures 4, 7a, 7b and Appendices G, J, and L



SOURCE: SANGIS 2017; Hunsaker 2019

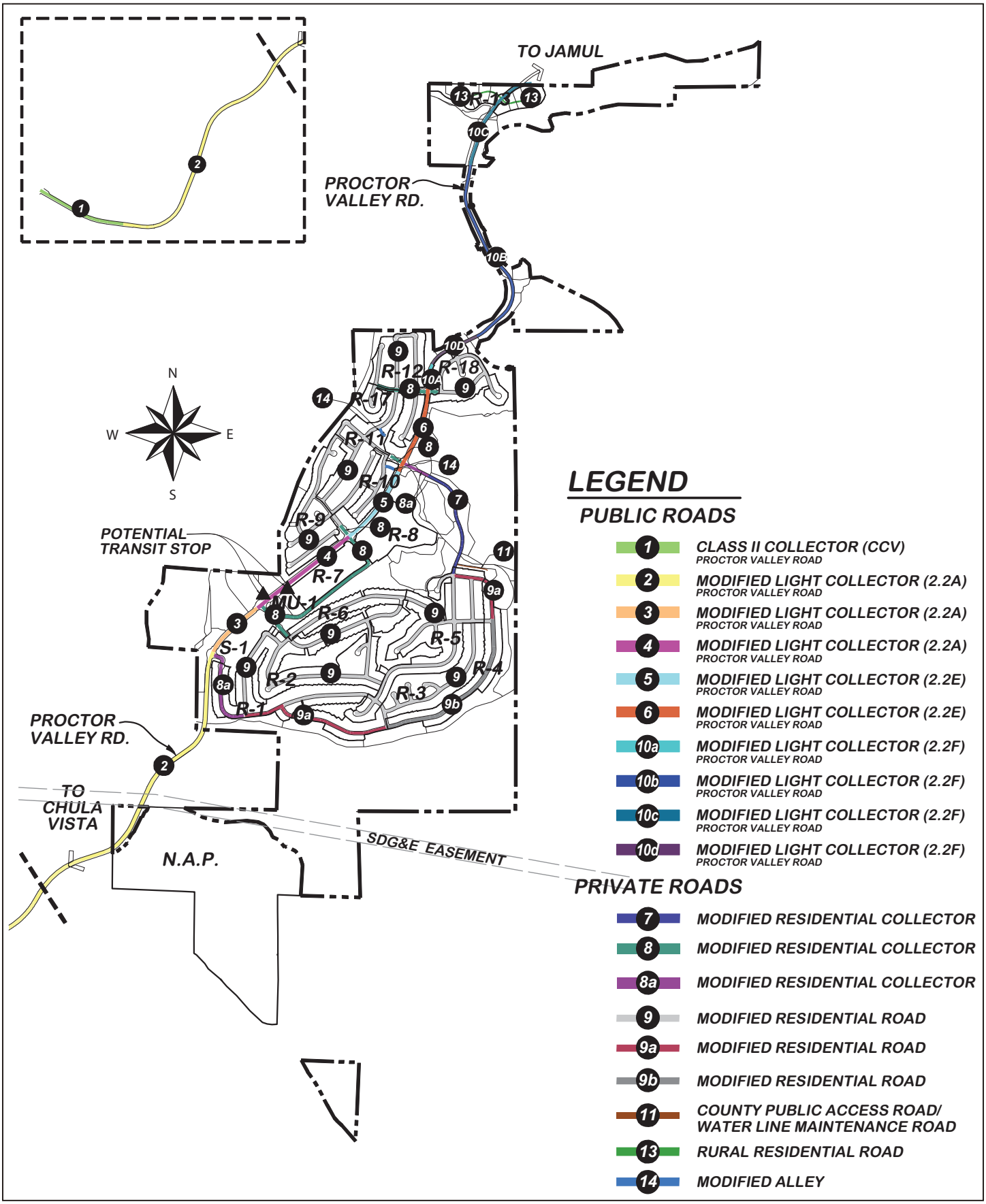
DUDEK

0 1,100 2,200 Feet

FIGURE 4

Vegetation Communities

Otay Ranch Village 14 and Planning Areas 16/19 Proposed Project Amendment

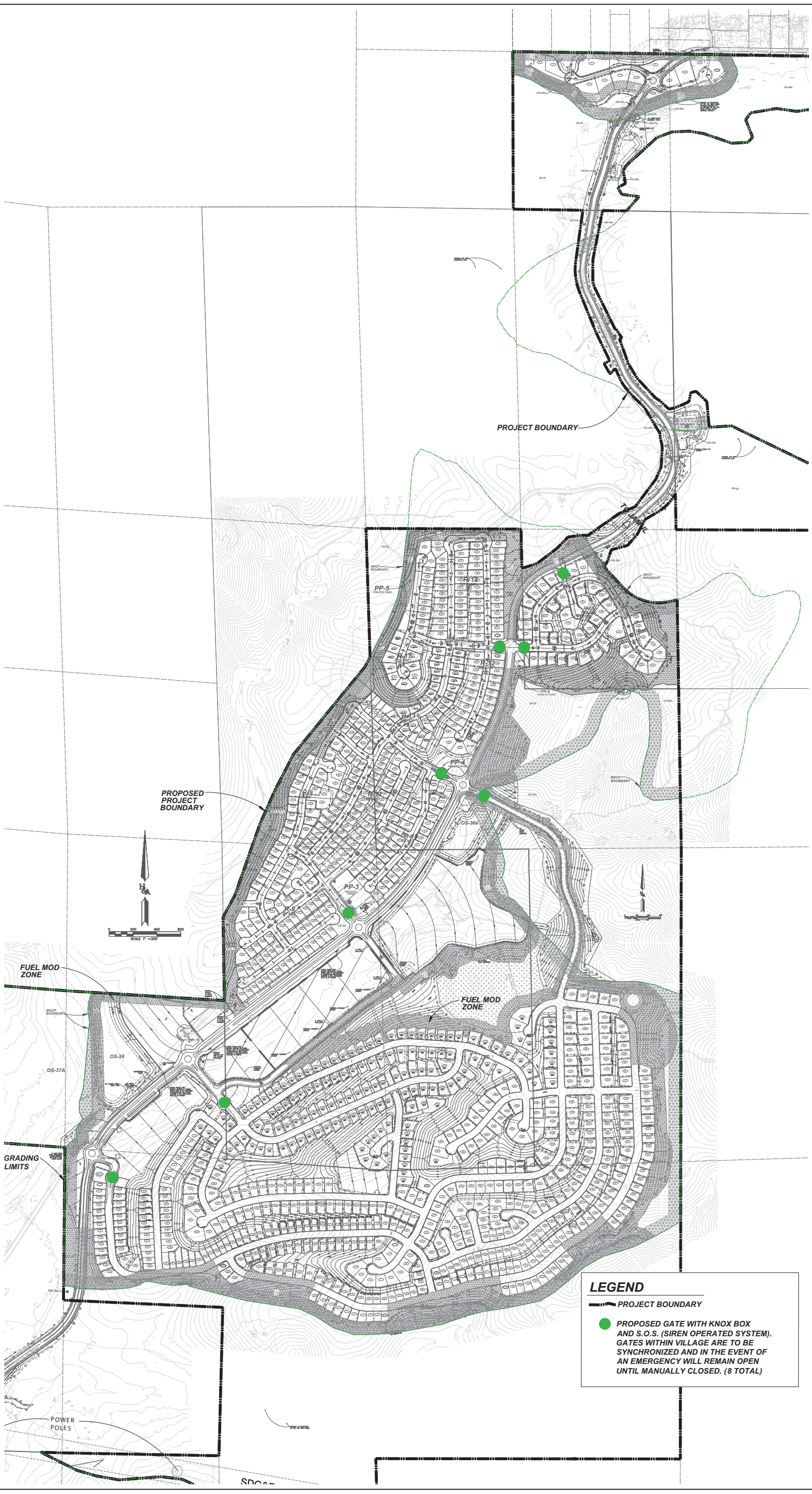


SOURCE: Hunsaker 2019

UPDATED FIGURE 7a

Circulation Plan

DUDEK



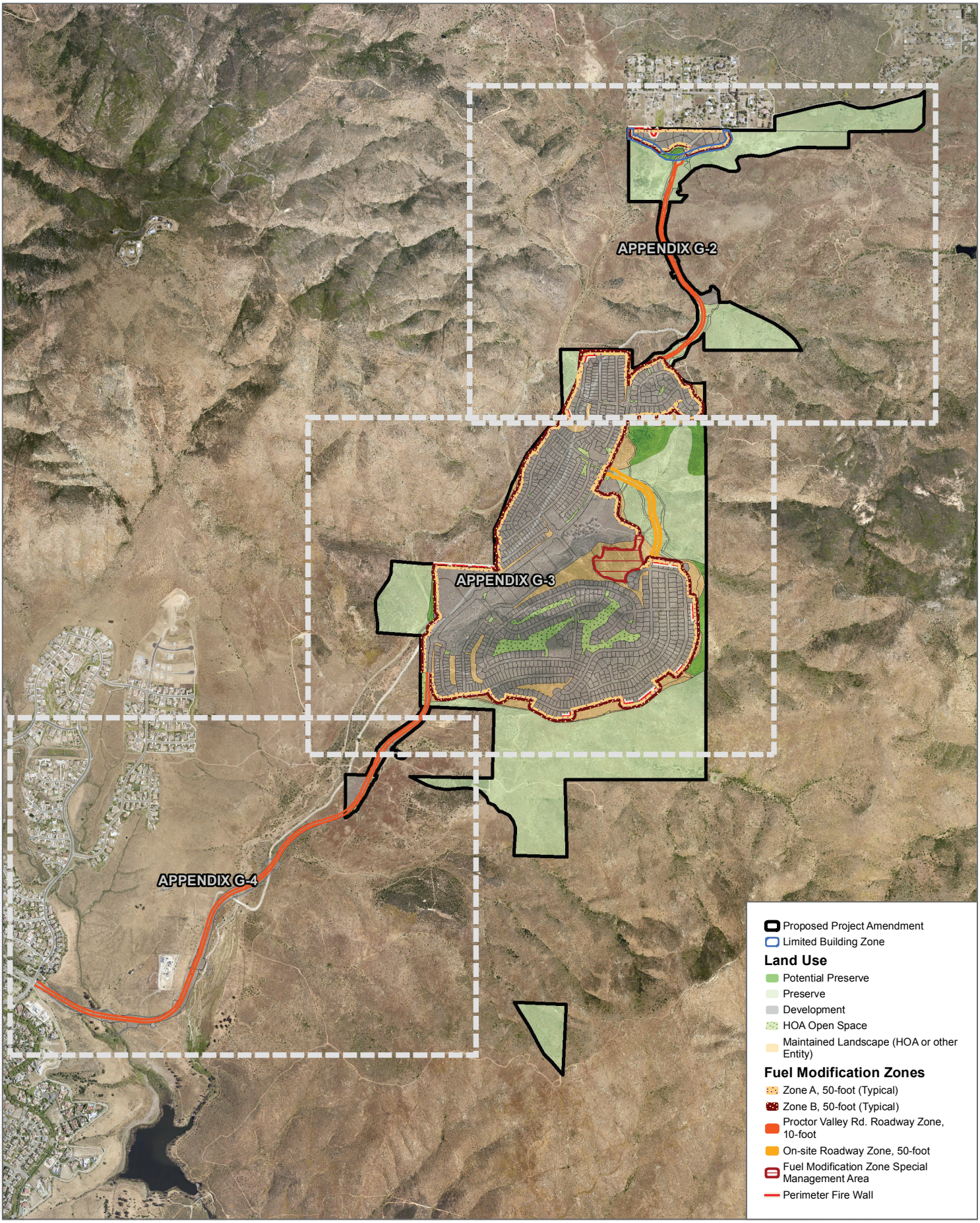
SOURCE: Hunsaker 2019

UPDATED FIGURE 7b

Gates and Emergency Access

Otay Ranch Village 14 and Planning Areas 16/19 Proposed Project Amendment

DUDEK



SOURCE: SANGIS 2017; Hunsaker 2019

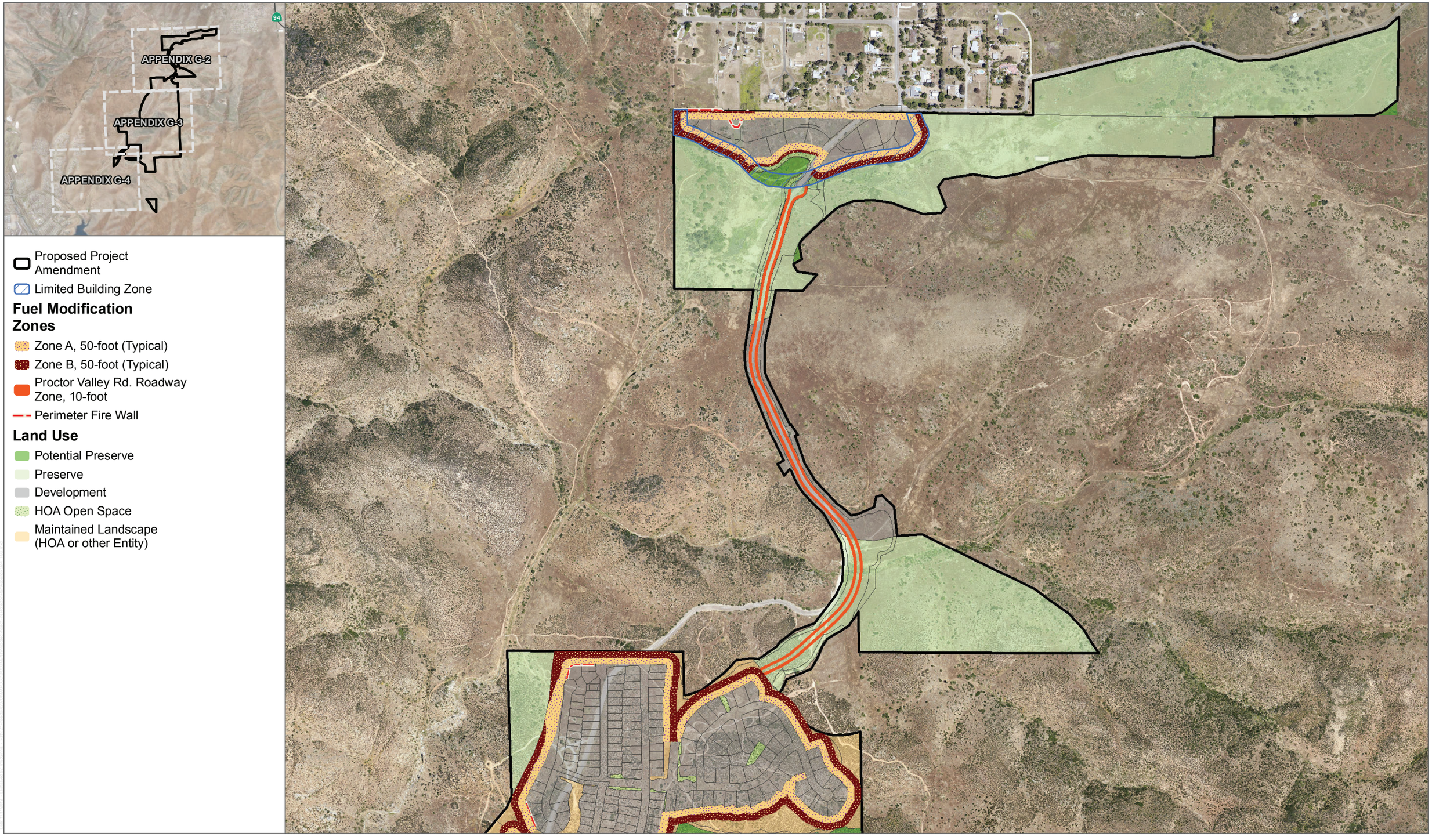
DUDEK

0 1,150 2,300 Feet

FIGURE G-1

Fuel Modification Zones - Index Map

Otay Ranch Village 14 and Planning Areas 16/19 Proposed Project Amendment



SOURCE: SANGIS 2017; Hunsaker 2019

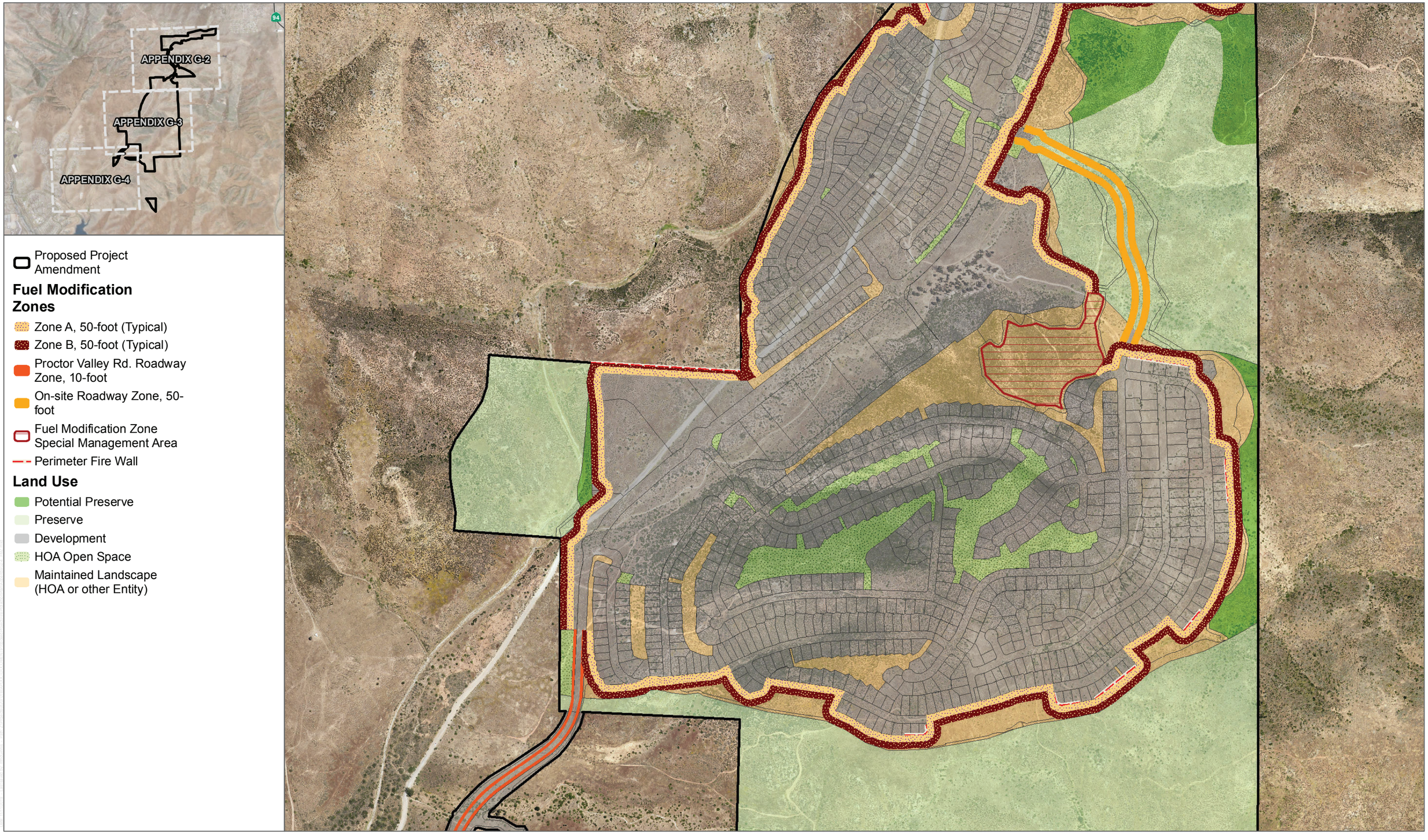
DUDEK

0 330 660 Feet

FIGURE G-1

Fuel Modification Zones

Otay Ranch Village 14 and Planning Areas 16/19 Proposed Project Amendment



SOURCE: SANGIS 2017; Hunsaker 2019

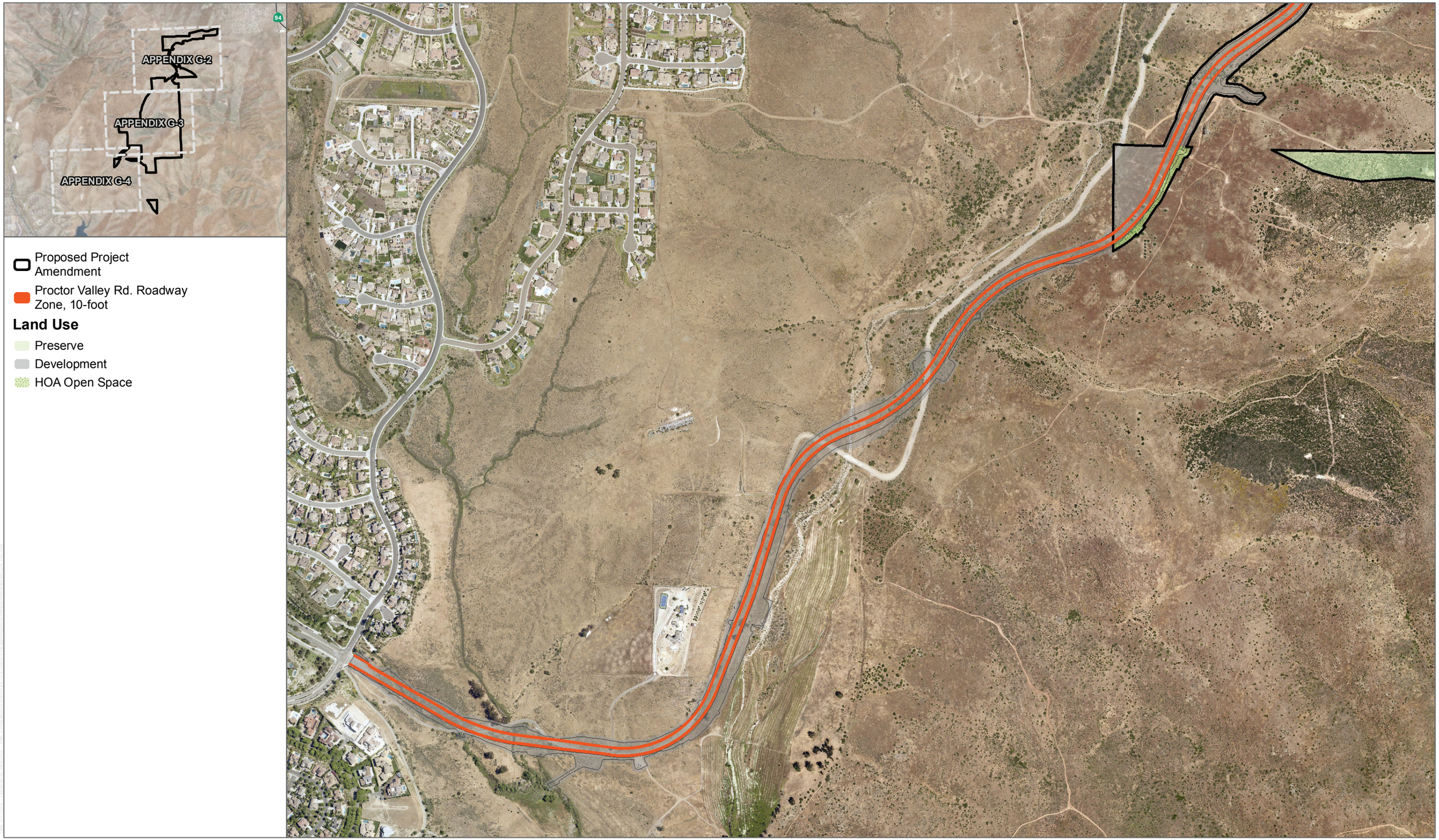
DUDEK

0 330 660 Feet

FIGURE G-2

Fuel Modification Zones

Otay Ranch Village 14 and Planning Areas 16/19 Proposed Project Amendment



SOURCE: SANGIS 2017; Hunsaker 2019

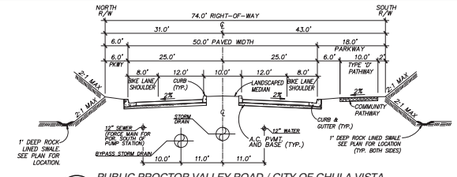
DUDEK

0 330 660 Feet

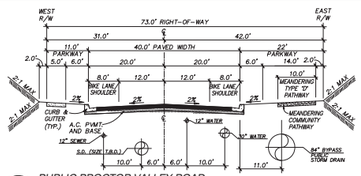
FIGURE G-3

Fuel Modification Zones

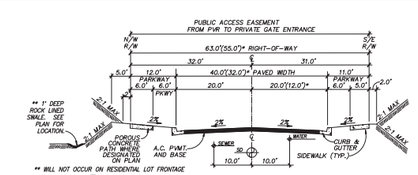
Otay Ranch Village 14 and Planning Areas 16/19 Proposed Project Amendment



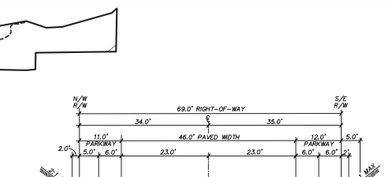
1 PUBLIC PROCTOR VALLEY ROAD / CITY OF CHULA VISTA
CLASS II COLLECTOR (CCV)
NO PARKING PERMITTED WITHIN BIKE LANE / SHOULDER
40 MPH DESIGN SPEED
NTS



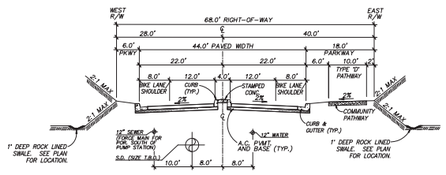
6 PUBLIC PROCTOR VALLEY ROAD
MODIFIED LIGHT COLLECTOR (2.2E)
NO PARKING PERMITTED
30 MPH DESIGN SPEED / 20 MPH AT ROUNDABOUT)
NTS
WAIVERS:
- MODIFICATIONS TO PARKWAYS AS SHOWN
- REDUCE DESIGN SPEED FROM 40 MPH TO 30 MPH (30 MPH)



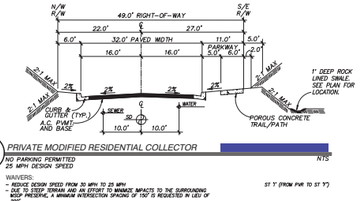
8a PRIVATE MODIFIED RESIDENTIAL COLLECTOR
PARKING PERMITTED ON BOTH SIDES OF STREET
25 MPH DESIGN SPEED
NTS
WAIVERS:
- REDUCE DESIGN SPEED FROM 30 MPH TO 25 MPH
- DUE TO STEEP TERRAIN AND AN EFFORT TO MINIMIZE IMPACTS TO THE SURROUNDING MSCP PRESERVE, A MINIMUM INTERSECTION SPACING OF 150' IS REQUESTED IN LIEU OF 200'.
- REDUCE MINIMUM HORIZONTAL CURVE RADIUS FROM 300' TO 200'
- MODIFICATIONS TO PARKWAY AS SHOWN
* PARKING CAN BE ELIMINATED ON ONE SIDE IF STREET IS NON-LOADED. SEE PLAN FOR LOCATIONS.
ST 'A' (FROM PVR TO ST 'B')
ST 'I' (FROM PVR TO ST 'I')



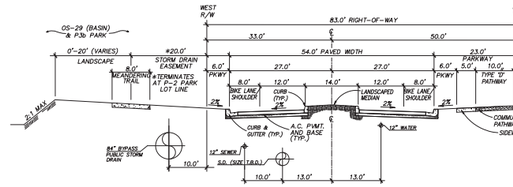
9b PRIVATE MODIFIED RESIDENTIAL ROAD
PARKING PERMITTED ON BOTH SIDES OF STREET
25 MPH DESIGN SPEED
NTS
WAIVERS:
- REDUCE DESIGN SPEED FROM 30 MPH TO 25 MPH
- MODIFICATIONS TO PARKWAY AS SHOWN
ST 'I' (FROM ST 'A' TO ST 'K')



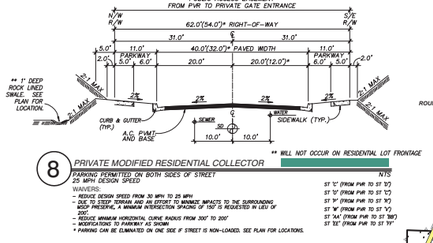
2 PUBLIC PROCTOR VALLEY ROAD
MODIFIED LIGHT COLLECTOR (2.2A)
NO PARKING PERMITTED
40 MPH DESIGN SPEED
NTS
WAIVERS:
- MODIFICATIONS TO PARKWAYS AS SHOWN
- MEDIAN REDUCED TO 4'
- RIGHT OF WAY REDUCED FROM 76' TO 68'



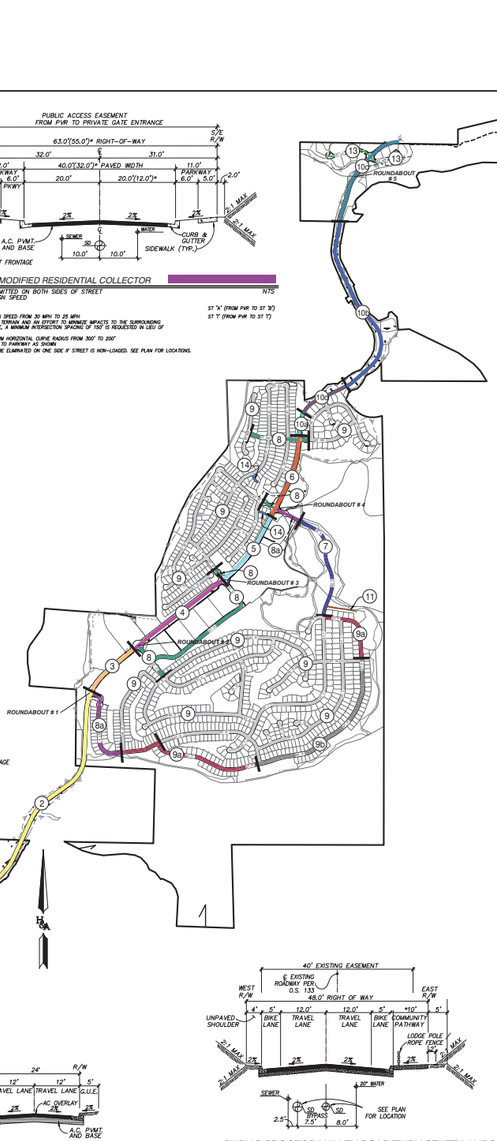
7 PRIVATE MODIFIED RESIDENTIAL COLLECTOR
NO PARKING PERMITTED
25 MPH DESIGN SPEED
NTS
WAIVERS:
- REDUCE DESIGN SPEED FROM 30 MPH TO 25 MPH
- DUE TO STEEP TERRAIN AND AN EFFORT TO MINIMIZE IMPACTS TO THE SURROUNDING MSCP PRESERVE, A MINIMUM INTERSECTION SPACING OF 150' IS REQUESTED IN LIEU OF 200'.
- REDUCE MINIMUM HORIZONTAL CURVE RADIUS FROM 300' TO 200'
- MODIFICATIONS TO PARKWAY AS SHOWN
ST 'I' (FROM PVR TO ST 'I')



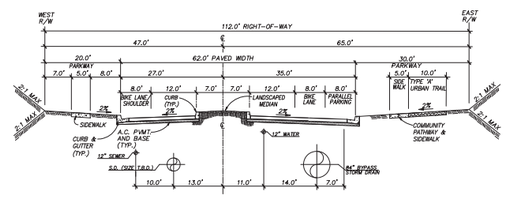
3 PUBLIC PROCTOR VALLEY ROAD
MODIFIED LIGHT COLLECTOR (2.2A)
NO PARKING PERMITTED
30 MPH DESIGN SPEED / 20 MPH AT ROUNDABOUT
NTS
WAIVERS:
- MODIFICATIONS TO PARKWAYS AS SHOWN
- REDUCE DESIGN SPEED FROM 40 MPH TO 30 MPH (30 MPH)



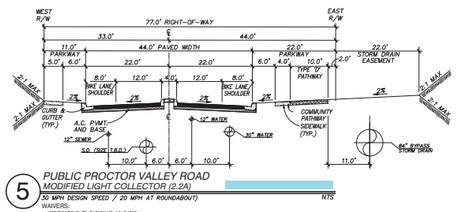
8 PRIVATE MODIFIED RESIDENTIAL COLLECTOR
PARKING PERMITTED ON BOTH SIDES OF STREET
25 MPH DESIGN SPEED
NTS
WAIVERS:
- REDUCE DESIGN SPEED FROM 30 MPH TO 25 MPH
- DUE TO STEEP TERRAIN AND AN EFFORT TO MINIMIZE IMPACTS TO THE SURROUNDING MSCP PRESERVE, A MINIMUM INTERSECTION SPACING OF 150' IS REQUESTED IN LIEU OF 200'.
- REDUCE MINIMUM HORIZONTAL CURVE RADIUS FROM 300' TO 200'
- MODIFICATIONS TO PARKWAY AS SHOWN
* PARKING CAN BE ELIMINATED ON ONE SIDE IF STREET IS NON-LOADED. SEE PLAN FOR LOCATIONS.
ST 'C' (FROM PVR TO ST 'D')
ST 'D' (FROM PVR TO ST 'C')
ST 'F' (FROM PVR TO ST 'G')
ST 'G' (FROM ST 'F' TO GUI, DE SAC)
ST 'I' (FROM ST 'F' TO GUI, DE SAC)
ST 'J' (FROM ST 'I' TO GUI, DE SAC)



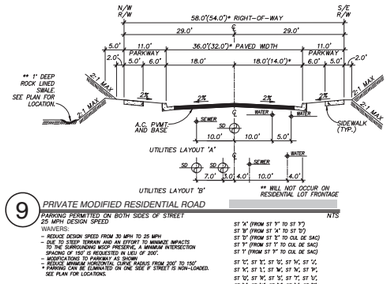
STREET KEY MAP
NOT TO SCALE



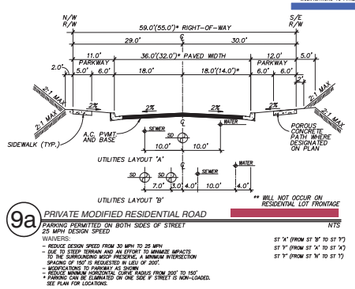
4 PUBLIC PROCTOR VALLEY ROAD
MODIFIED LIGHT COLLECTOR (2.2A)
30 MPH DESIGN SPEED / 20 MPH AT ROUNDABOUT
NTS
WAIVERS:
- MODIFICATIONS TO PARKWAYS AS SHOWN
- REDUCE DESIGN SPEED FROM 40 MPH TO 30 MPH (30 MPH)
- RIGHT OF WAY INCREASED FROM 76' TO 112'



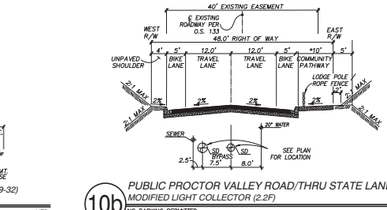
5 PUBLIC PROCTOR VALLEY ROAD
MODIFIED LIGHT COLLECTOR (2.2A)
30 MPH DESIGN SPEED / 20 MPH AT ROUNDABOUT)
NTS
WAIVERS:
- MODIFICATIONS TO PARKWAYS AS SHOWN
- REDUCE DESIGN SPEED FROM 40 MPH TO 30 MPH (30 MPH)
- RIGHT OF WAY INCREASED FROM 64' TO 77'



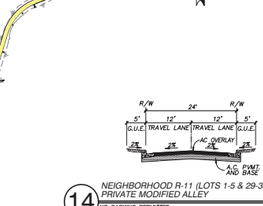
9 PRIVATE MODIFIED RESIDENTIAL ROAD
PARKING PERMITTED ON BOTH SIDES OF STREET
25 MPH DESIGN SPEED
NTS
WAIVERS:
- REDUCE DESIGN SPEED FROM 30 MPH TO 25 MPH
- DUE TO STEEP TERRAIN AND AN EFFORT TO MINIMIZE IMPACTS TO THE SURROUNDING MSCP PRESERVE, A MINIMUM INTERSECTION SPACING OF 150' IS REQUESTED IN LIEU OF 200'.
- REDUCE MINIMUM HORIZONTAL CURVE RADIUS FROM 300' TO 200'
- MODIFICATIONS TO PARKWAY AS SHOWN
* PARKING CAN BE ELIMINATED ON ONE SIDE IF STREET IS NON-LOADED. SEE PLAN FOR LOCATIONS.
ST 'A' (FROM ST 'F' TO ST 'I')
ST 'B' (FROM ST 'A' TO ST 'D')
ST 'D' (FROM ST 'B' TO GUI, DE SAC)
ST 'F' (FROM ST 'I' TO GUI, DE SAC)
ST 'I' (FROM ST 'F' TO GUI, DE SAC)
ST 'C', ST 'E', ST 'G', ST 'H', ST 'J', ST 'K', ST 'L', ST 'M', ST 'N', ST 'O', ST 'P', ST 'Q', ST 'R', ST 'S', ST 'T', ST 'U', ST 'V', ST 'W', ST 'X', ST 'Y', ST 'Z', ST 'AA', ST 'AB', ST 'AC', ST 'AD', ST 'AE', ST 'AF', ST 'AG'



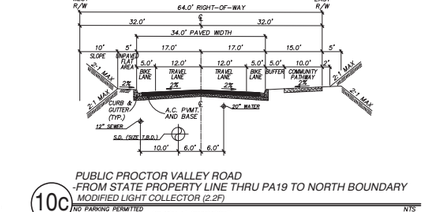
9a PRIVATE MODIFIED RESIDENTIAL ROAD
PARKING PERMITTED ON BOTH SIDES OF STREET
25 MPH DESIGN SPEED
NTS
WAIVERS:
- REDUCE DESIGN SPEED FROM 30 MPH TO 25 MPH
- DUE TO STEEP TERRAIN AND AN EFFORT TO MINIMIZE IMPACTS TO THE SURROUNDING MSCP PRESERVE, A MINIMUM INTERSECTION SPACING OF 150' IS REQUESTED IN LIEU OF 200'.
- REDUCE MINIMUM HORIZONTAL CURVE RADIUS FROM 300' TO 200'
- MODIFICATIONS TO PARKWAY AS SHOWN
* PARKING CAN BE ELIMINATED ON ONE SIDE IF STREET IS NON-LOADED. SEE PLAN FOR LOCATIONS.
ST 'K' (FROM ST 'F' TO ST 'I')
ST 'F' (FROM ST 'K' TO ST 'K')
ST 'I' (FROM ST 'K' TO ST 'I')



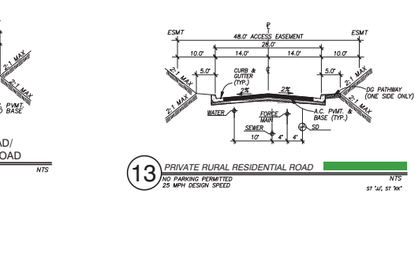
10b PUBLIC PROCTOR VALLEY ROAD/THRU STATE LANDS
MODIFIED LIGHT COLLECTOR (2.2F)
NO PARKING PERMITTED
40 MPH DESIGN SPEED
*WIDTH OF COMMUNITY PATHWAY MAY VARY DUE TO INSTALLATION OF SIGNS FOR SHORT DISTANCES
WAIVERS:
- MODIFICATIONS TO PAVEMENT, SHOULDER, PARKWAY AND ROW WIDTHS AS SHOWN.
NTS



14 NEIGHBORHOOD R-11 (LOTS 1-5 & 29-32)
PRIVATE MODIFIED ALLEY
NO PARKING PERMITTED
25 MPH DESIGN SPEED
NTS

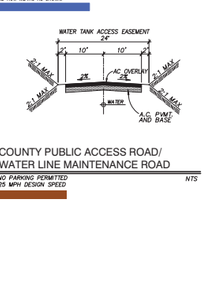


10d PUBLIC PROCTOR VALLEY ROAD/THRU STATE LANDS
MODIFIED LIGHT COLLECTOR (2.2F)
NO PARKING PERMITTED
40 MPH DESIGN SPEED
*WIDTH OF COMMUNITY PATHWAY MAY VARY DUE TO INSTALLATION OF SIGNS FOR SHORT DISTANCES
WAIVERS:
- MODIFICATIONS TO PAVEMENT, SHOULDER, PARKWAY AND ROW WIDTHS AS SHOWN.
NTS



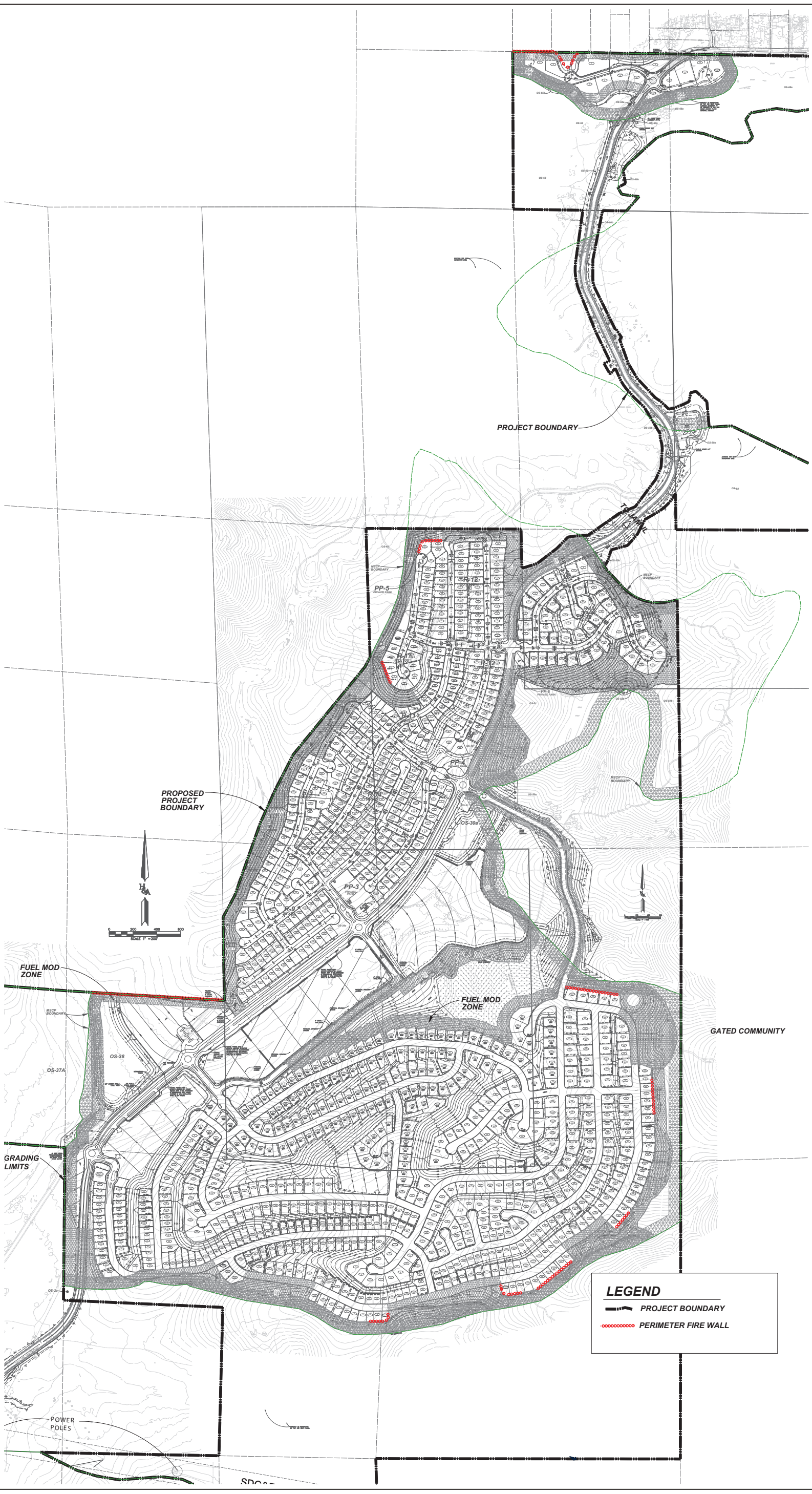
10a PUBLIC PROCTOR VALLEY ROAD TRANSITION FROM 6 TO 10d
MODIFIED LIGHT COLLECTOR (2.2F)
NO PARKING PERMITTED
30 MPH DESIGN SPEED
NTS
WAIVERS:
- MODIFICATIONS TO PARKWAYS AS SHOWN
- REDUCE DESIGN SPEED FROM 40 MPH TO 30 MPH

10c PUBLIC PROCTOR VALLEY ROAD
-FROM STATE PROPERTY LINE THRU PA19 TO NORTH BOUNDARY
MODIFIED LIGHT COLLECTOR (2.2F)
NO PARKING PERMITTED
40 MPH DESIGN SPEED / (20 MPH AT ROUNDABOUT)
NTS
WAIVERS:
- MODIFICATIONS TO PAVEMENT, SHOULDER, PARKWAY AND ROW WIDTHS AS SHOWN.



11 COUNTY PUBLIC ACCESS ROAD/
WATER LINE MAINTENANCE ROAD
NO PARKING PERMITTED
25 MPH DESIGN SPEED
NTS

13 PRIVATE RURAL RESIDENTIAL ROAD
NO PARKING PERMITTED
25 MPH DESIGN SPEED
NTS
ST 'AJ' ST 'AK'



SOURCE: Hunsaker 2019

UPDATED APPENDIX L

Perimeter Fire Wall Exhibit

Otay Ranch Village 14 and Planning Areas 16/19 Proposed Project Amendment

DUDEK

OTAY RANCH
VILLAGE 14 AND PLANNING
AREAS 16/19
FIRE PROTECTION PLAN
Record ID: PDS2016-SP-16-002
Environmental Log No. PDS2016-ER-16-19-006

Prepared for:

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SEPTEMBER 2018

Printed on 30% post-consumer recycled material.

Summary of Appendix 3.1.1-2 Fire Protection Plan Text Changes

Section (Page)	Change	Reason for Change
Section 3 (pg. 33)	Revised description of Ignition Sources	Response to Comment
Appendix G	Revised to show FMZ on cover sheet	Response to Comment
Appendix H	Updated list of suggested plans	Response to Comment

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TABLES

ACRONYMS AND ABBREVIATIONS

Acronym/Abbreviation	Definition
CSA	County Service Area
DPW	San Diego County Department of Public Works
FMZ	fuel modification zone
FPP	Fire Protection Plan
GDP	General Development Plan
HOA	Homeowner's Association
LBZ	limited building zone
LDA	Limited Development Area
MSCP	Multiple Species Conservation Program
NFPA	National Fire Protection Association
RMP	Resource Management Plan
SDCFA	San Diego County Fire Authority
SRP	Subregional Plan
WFEP	Wildland Fire Evacuation Plan
WUI	wildland/urban interface

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EXECUTIVE SUMMARY

This Fire Protection Plan (FPP) is for Otay Ranch Village 14 and Planning Areas 16/19 (Proposed Project), as referred to in the Otay Ranch General Development Plan/Subregional Plan (Otay Ranch GDP/SRP), in San Diego County. This FPP provides measures for fire protection that meet the 2017 San Diego County Consolidated Fire Code. The Proposed Project would be required to meet the adopted codes at the time of construction. This FPP also identifies the fire risk associated with the Proposed Project's planned land uses, and identifies requirements for fuel modification, building design and construction, and other pertinent development infrastructure criteria for fire protection. The primary focus of this FPP is to provide an implementable framework for suitable protection of the planned structures and the people living there. Tasks completed in preparation of this FPP include data review, code review, site fire risk analysis, land use plan review, fire behavior modeling, and site-specific recommendations.

Where possible, this FPP incorporates principles of sustainability, which are an important component of the Proposed Project. Preservation and conservation of resources, including energy, water, and native plant communities within the Otay Ranch Resource Management Plan (RMP)/Multiple Species Conservation Program (MSCP) Preserve, is an important component of the Proposed Project and has been duly considered and integrated into this FPP where it does not lessen fire protection.

The Proposed Project is located in southwestern San Diego County between the City of Chula Vista and the community of Jamul. The applicant-owned area totals approximately 1,283.5 acres within Village 14 (723.7 acres) and Planning Areas 16/19 (559.8 acres). The Project Area also includes 85.4 acres of off-site development, primarily for Proctor Valley Road improvements, for a total of approximately 1,369 acres.

A portion of the Project Area is proposed for the development of a master-planned, residential community. At build-out, the Proposed Project would include residential areas, a school site, a public safety site, a commercial area, and circulation elements. Within the Development Footprint, there would also be parks and recreation facilities. A total of 427.1 acres within the Project Area would be conveyed to the Otay Ranch RMP/MSCP Preserve. Approximately 536.7 acres are designated to Preserve and managed open space and parks (345.7 acres in Village 14 and an additional 191.0 acres in Planning Areas 16/19).[1]

[1] Additional off-site Otay Ranch RMP Preserve would be conveyed to meet the 1.188 RMP Preserve Conveyance Obligation.

The Proposed Project would be built in five phases (North Village 14, Central Village 14, and South Village 14 phases, and Planning Areas 16/19 phases) and would include single-family and multifamily residential; mixed-use; retail/commercial; a public safety site; an elementary school site; park and recreation facilities; and related water, sewer, electrical, and roadway infrastructure necessary within a planned community.

Fire service would be provided by the San Diego County Fire Authority (SDCFA) from a centrally located station capable of responding to 96% of the Proposed Project's lots, including all lots within the Village Core and limited semi-rural residential areas within the County of San Diego's General Plan 5-minute travel time standard. Existing Station 36 can respond to a portion of the remaining 4% of the lots within 5 minutes' travel, and the remaining lots within 6 minutes, well below the 10-minute travel time standard for the larger lot, semi-rural residential areas. SDCFA would serve the Proposed Project because it is located within its jurisdiction, and the County has indicated it can and would provide fire and emergency medical response. The other fire agency in the area is the Chula Vista Fire Department, but the Proposed Project is not within its jurisdictional area, and neither of the two closest Chula Vista Fire Department fire stations can provide service to any of the proposed structures within the County of San Diego General Plan's 5-minute travel time standard.

The structures in the Proposed Project would be built using ignition-resistant materials pursuant to the most recent County of San Diego Fire and Building Codes (Chapter 7-A – focusing on structure ignition resistance from flame impingement and flying embers in areas designated as high fire hazard areas), which are the amended California Fire and Building Codes. This would be complemented by an improved water availability, capacity, and delivery system; Project Area firefighting resources; fire department access throughout the developed areas; monitored defensible space/fuel modification; interior, automatic fire sprinkler systems in all structures; monitored interior sprinklers in applicable structures; and other components that would provide properly equipped and maintained structures with a high level of fire ignition resistance.

The site fire risk analysis resulted in the determination that wildfire has occurred and will likely occur near the Project Area again, but the Proposed Project would provide ignition-resistant landscape and structures, and defensible space with implementation of specified safety measures. Based on modeling and analysis of the Project Area to assess its unique fire risk and fire behavior, it was determined that the California and San Diego County standard of 100-foot-wide fuel modification zones (FMZs) would be suitable to protect the Proposed Project from an anticipated wildfire that may burn in areas adjacent to developed areas. This 100-foot-wide FMZ, when properly maintained, has proven effective at minimizing structure ignition from direct flame impingement or radiant heat, especially for structures constructed using the latest

ignition-resistant codes. The FMZs for Village 14 would be maintained in perpetuity by a funded Community Facilities District, Homeowner's Association (HOA), or similarly funded entity.

FMZs on private lots in Planning Areas 16/19 would be maintained by the property owner, but monitored and enforced by the HOA or Approved Maintenance Entity, ensuring that the required fuel reduction work occurs annually and FMZs are functional. Limited building zones (LBZs) or Limited Development Areas (LDAs) would be provided on all large lots (Planning Area 16) where adjacent to the Otay Ranch RMP/MSCP Preserve. LBZs and LDAs would ensure that appropriate buffers are available from designated open space should additional buildings be constructed on the large lots. If an accessory building is constructed adjacent to an LBZ, the LBZ can be maintained as an FMZ.

In addition to the code-required fire protection features, the Proposed Project would provide additional measures, including heat-deflecting landscape walls at strategic perimeter locations to augment the FMZs and to provide additional perimeter protection for homes with a downslope at the edge of a rear yard, as discussed in more detail in this FPP.

This FPP provides a detailed analysis of the Proposed Project, the potential risk from wildfire, and potential impacts on the SDCFA, as well as an analysis on meeting or exceeding the requirements of the County of San Diego. Further, this FPP provides requirements, recommendations, and measures to reduce the risk and potential impacts to acceptable levels, as determined by the SDCFA.

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1 INTRODUCTION

This Fire Protection Plan (FPP) was prepared for the Otay Ranch Village 14 and Planning Areas 16/19 (Proposed Project). The purpose of this FPP is to evaluate the potential impacts resulting from wildland fire hazards and identify measures necessary to adequately mitigate those risks to a level consistent with County of San Diego (County) thresholds. Additionally, this FPP generates and memorializes the fire safety requirements of the fire authority having jurisdiction, which is the San Diego County Fire Authority (SDCFA). Requirements and recommendations detailed in this FPP are based on site-specific characteristics, applicable code requirements, and input from the Proposed Project's applicant and the fire authority having jurisdiction.

As part of the assessment, this FPP includes evaluation of, among other site factors, the property location, topography (including saddles, chutes, chimneys), geology, combustible vegetation (fuel types), climatic conditions, and fire history. This FPP addresses water supply, access (including secondary access, where applicable), structural ignitability and ignition-resistive building features, fire protection systems and equipment, potential impacts to existing emergency services, defensible space, and vegetation management. It also identifies and prioritizes areas for potentially hazardous fuel reduction treatments and recommends the types and methods of treatment to protect the community and essential infrastructure. This FPP also recommends measures that property owners and the Homeowner's Association (HOA) could take to reduce the probability of structure ignition throughout the area.

The Proposed Project is located within the boundaries of the SDCFA in the unincorporated portion of the County. This FPP addresses SDCFA's and California Department of Forestry and Fire Protection's (CAL FIRE) response capabilities and response travel time within the Project Area, along with projected funding for facility improvements and fire service maintenance.

The following tasks were performed to complete this FPP:

- 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.

- Collect site photographs and map fuel conditions using 200-scale aerial images. Field observations were used to augment existing digital site data in generating the fire behavior models and formulating the recommendations presented in this FPP. Refer to Appendix A for site photographs of existing site conditions.
- Evaluate nearby firefighting and emergency medical resources.
- Prepare this FPP detailing how fire risk would be mitigated through a system of fuel modification, structural ignition resistance enhancements, and fire protection delivery system upgrades.

1.1 Intent

The intent of this FPP is to provide fire planning guidance and requirements for reducing fire risk and demand for fire protection services associated with the Proposed Project. To that end, the fire protection "system" detailed in this FPP includes redundant layering of measures, including pre-planning, fire prevention, fire protection, passive and active suppression, and related measures proven to reduce fire risk. The fire protection system planned for the Proposed Project has proven, through real-life wildfire encroachment examples throughout Southern California, to reduce the fire risk associated with this type of residential community.

1.2 Applicable Codes/Existing Regulations

This FPP demonstrates that the Proposed Project would comply with applicable portions of the 2017 Consolidated Fire Code or the most current fire and building codes at the time of tentative map approval. The Proposed Project also would be consistent with the 2016 California Building Code, Chapter 7-A; the 2016 California Fire Code, Chapter 49; and the 2016 California Residential Code, Section 237 as adopted by San Diego County. Chapter 7-A of the California Building Code addresses reducing ember penetration into homes, a leading cause of structure loss from wildfires (California Building Standards Commission 2016). Thus, code compliance is an important component of the requirements of this FPP, given the Proposed Project's wildland/urban interface (WUI) location that is within an area statutorily designated as a Very High Fire Hazard Severity Zone by CAL FIRE (FRAP 2015). Fire hazard designations are based on topography, vegetation, and weather, among other factors with more hazardous sites, including steep terrain, unmaintained fuels/vegetation, and WUI locations. Projects situated in Very High Fire Hazard Severity Zones require fire hazard analysis and application of fire protection measures to create defensible communities within these WUI locations. As described in this FPP, the Proposed Project would meet applicable code requirements for building in these higher fire hazard areas, or meet the intent of the code through the application of site-specific fire protection measures. This is applicable for potential accessory structures in Planning Areas 16/19

and a limited number of lots where less than 100 feet of fuel modification zones (FMZs) is proposed. These codes have been developed through decades of wildfire structure save and loss evaluations to determine the causes building loss during wildfires. The resulting fire codes now focus on mitigating former structural vulnerabilities through construction techniques and materials so that the buildings are resistant to ignitions from direct flames, heat, and embers, as indicated in the 2016 California Building Code (Chapter 7-A, Section 701A Scope, Purpose, and Application) (California Building Standards Commission 2016).

1.3 Proposed Project Summary

1.3.1 Location

The Project Area encompasses approximately 1,283.6 acres and is located in Otay Ranch Village 14 and Planning Areas 16/19, within the Proctor Valley parcel of the Otay Ranch General Development Plan/Otay Subregional Plan (GDP/SRP) area in southwestern San Diego County. The total Project Area includes approximately 85.4 acres of off-site improvements, primarily associated with proposed Proctor Valley Road improvements, for a total Project Area of 1,369 acres. The Project Area is located approximately 0.25 miles east of the City of Chula Vista and 1.8 miles southwest of the unincorporated community of Jamul (Figure 1, Regional Map).

Additionally, the Project Area is located northeast of Upper Otay Reservoir and is bordered by open space to the northwest and southeast. More specifically, the Proposed Project is located to the northwest and southeast of Proctor Valley Road, within the northern half of Section 30, eastern half of Section 19, western half of Section 20, and southwest quarter of Section 17 of the Jamul Mountains U.S. Geological Survey 7.5-minute quadrangle, Township 17 South, Range 1 East.

Regional access to Otay Ranch Village 14 is provided by State Route (SR) 125, located approximately 3 miles to the west. Interstate (I) 805, approximately 8 miles to the west, provides secondary north/south access. SR-54, located approximately 6 miles to the northwest, connects to SR-125 and I-805 and provides regional east/west access. SR-94 is approximately 2 miles to the east and provides north/south travel.

Proctor Valley Road would provide the main access to the Proposed Project. Four roundabouts in Village 14 and one roundabout in Planning Areas 16/19 would identify the entrance into each residential area, and provide traffic calming at key internal intersections. The internal circulation plan also includes a series of collectors and residential streets to provide access to the residential neighborhoods; with Planning Areas 16/19 designed to County Rural Road Standards. A secondary access to the easternmost portion of Planning Area 16 is the planned extension of existing Whispering Meadows Road.

Proctor Valley Road is an existing rural improved two-lane road and is designated as a scenic corridor. The northern connection of Otay Ranch Village 14 to Jamul would remain substantially in the alignment of the existing partially improved Proctor Valley Road and would provide both public and emergency services access to both communities.

1.3.2 Vicinity Land Use

Existing land uses surrounding the Proposed Project vary from highly urbanized areas to open space lands (Figure 2, Vicinity Map). Development is primarily concentrated around Rancho San Diego to the north and the rural community of Jamul to the northeast. Existing development, including the East Lake Vistas, Rolling Hills Ranch, and Bella Lago residential communities is located to the southwest of the Project Area. Upper and Lower Otay Reservoirs and the proposed Resort Village (Village 13) are located to the south and southeast of the Project Area. Jamul is composed of primarily large-lot estates, horse ranches, and agriculture.

Most of the land in the vicinity of the Proposed Project to the west and east is undeveloped; some of this land consists of gently rolling hills used for agriculture and grazing and some is more rugged, steep open space. The San Diego National Wildlife Refuge is located to the west of the Proctor Valley Parcel. The Refuge stretches from Jamul to communities in Spring Valley and eastern Chula Vista. The Bureau of Land Management manages two separate parcels within the northern portion of the Proctor Valley Parcel of Otay Ranch. The large northern out parcel encompasses the Callahan Mountain Peak and some of the tops of side-slopes extending down from the peak. City of San Diego's Multiple Species Conservation Program (MSCP) "Cornerstone Lands" are located adjacent to the Project Area to the south.

1.3.3 Proposed Project Description

1.3.3.1 Overview and Background

The Proposed Project (defined below) would be part of the overall Otay Ranch, an approximately 23,000-acre master-planned community in southern San Diego County designed as a series of villages and planning areas. The Proposed Project addressed by this technical report would be located within a portion of Otay Ranch Village 14 and Planning Areas 16/19 in the Proctor Valley area of Otay Ranch, as shown in Figure 1.

SOURCE: Hunsaker 2017

FIGURE 1

Regional Map

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Otay Ranch Village 14 and Planning Areas 16/19

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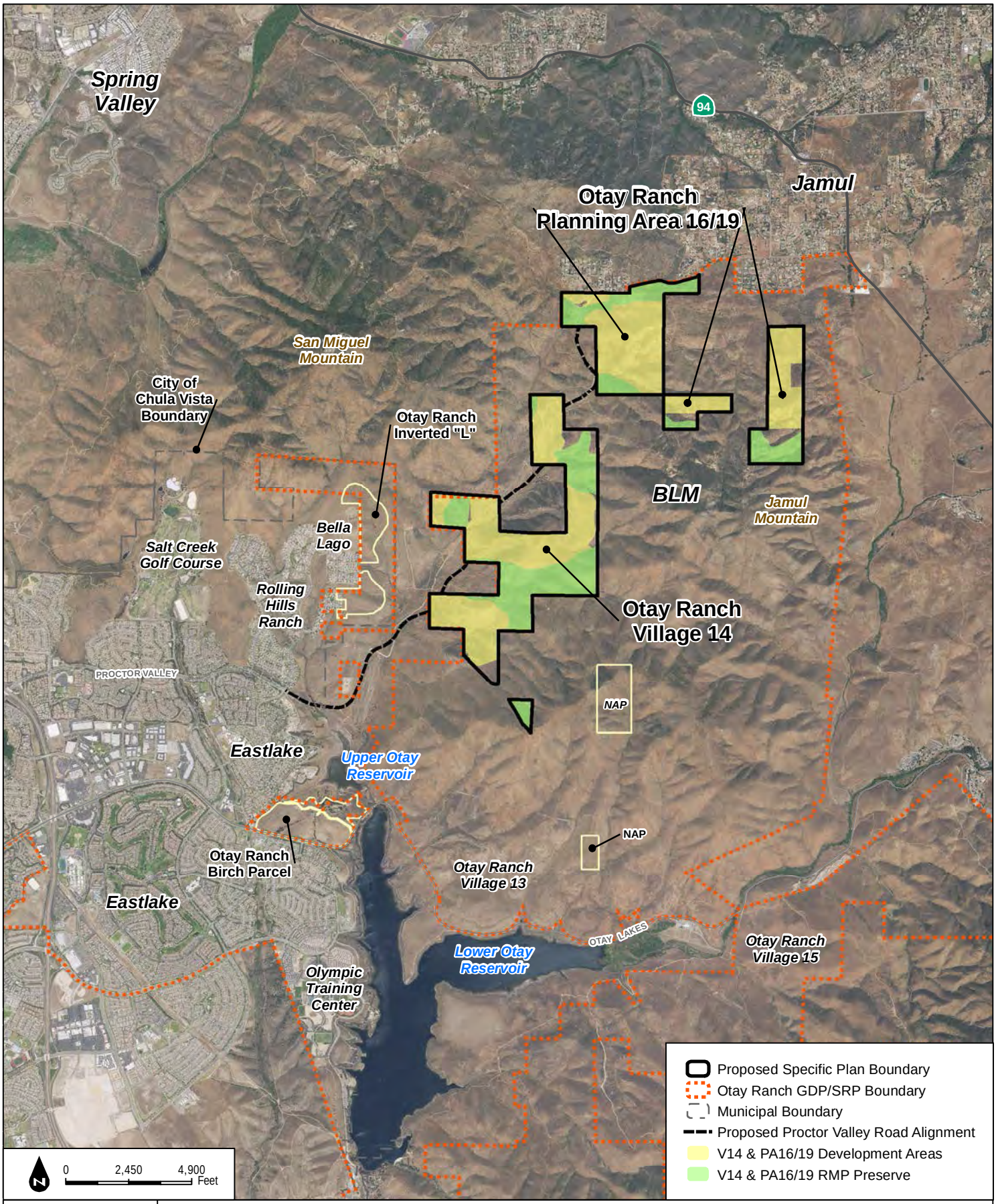

DUDEK

SOURCE: NAIP 2016; Hunsaker 2017; County of San Diego 1997

FIGURE 2

Vicinity Map

Otay Ranch Village 14 and Planning Areas 16/19

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The underlying purpose of the Proposed Project is to implement the adopted Otay Ranch GDP/SRP, Volume II (County of San Diego 1993), and complete the planned development within Jackson Pendo Development Company's (applicant) ownership of Village 14 and Planning Areas 16/19. The Otay Ranch GDP/SRP is a component part of the County General Plan (County of San Diego 2011) and allows for a total of 2,123 homes in Otay Ranch Village 14 and Planning Areas 16/19. The Proposed Project's 1,119 homes represent a portion of the total 2,123 homes originally authorized in the Otay Ranch GDP/SRP.

The Proposed Project is designed to be consistent with the Otay Ranch GDP/SRP's Village Character Policy "to serve as a transitional area between urban densities to the west and Jamul to the east." The Proposed Project is, therefore, designed to provide a transitional village between the densities and character of eastern Chula Vista and the more rural community of Jamul. The Proposed Project proposes 1,119 homes, 994 of which would be in Village 14 and 125 homes in Planning Areas 16/19, as shown in Table 1, Village 14 and Planning Areas 16/19 Site Utilization Plan Summary.

Table 1
Village 14 and Planning Areas 16/19 Site Utilization Plan Summary

Description	Village 14		Planning Areas 16/19		Total Proposed Project	
	Gross	*Target*	*Gross*	*Target*	*Gross*	*Target*
	Acres[a,b]	*Units[c]*	*Acres[d,e]*	*Units*	*Acres*	*Units*
Residential Subtotal	*344.2*	*897.0*	*363.6*	*125*	*707.7*	*1,022*
Residential Use on School Site (9.7 acres)[c]	—	97	—	—	—	97
Non-Residential Uses						
Mixed Use[f]	1.7	—	—	—	1.7	—
Public Parks	13.8	—	1.4	—	15.2	—
Private Parks/Recreation[b]	4.5	—	—	—	4.5	—
Public Safety Site	2.3	—	—	—	2.3	—
Elementary School Site[c]	9.7	—	—	—	9.7	—
Open Space	27.6	—	2.1	—	29.7	—
Conserved Open Space	36.9	—	35.5	—	72.4	—
Otay Ranch Resource Management Plan (RMP) / MSCP Preserve	270.2	—	156.5	—	426.7	—
Circulation	12.7	—	0.8	—	13.8	—
Non-Residential Uses Subtotal	*379.5*	—	*196.3*	—	*575.8*	—
Total Proposed Project[g]	**723.7**	**994**	**559.8**	**125**	**1,283.5**	**1,119**

a Residential gross acres in Village 14 includes 96.0 acres of related internal slopes, fuel modification, and/or Preserve edge.
b Village 14 has 5.0 acres of private pocket parks (PPP) included in the residential acreage; therefore, the subtotal, including PPPs, is 9.5 acres.
c Units allocated to school site at 10 dwelling unit per acre per the Otay Ranch GDP/SRP policies. Should school site not be needed, 97 units may be built. Should the school site be needed, the total target units is 897 in Village 14 and 1,022 total.
d Residential gross acres in Planning Areas 16/19 includes 14.1 acres of related private lift and pump stations.
e Residential gross acres in Planning Areas 16/19 includes 127.1 acres of Limited Development Area (LDA).
f Village 14 mixed-use acreage includes 10,000 square feet of commercial use.
g 85.4 acres of off-site impacts are in excluded from the acreage in Table 1.

1.3.4 Definitions

The following describes the major components and characteristics of the Proposed Project.

County. The "County" is the County of San Diego jurisdiction.

"Project Area" Defined: The "Project Area" is the applicant's ownership within Otay Ranch Village 14 and Planning Areas 16/19 in addition to certain off-site areas for infrastructure as depicted in Figure 1. The Project Area covers approximately 1,283.6 acres owned by the applicant and approximately 85.4 acres of off-site improvements, described below, for a total of 1,369 acres.

Study Area. The "Study Area" includes the Project Area as well as areas beyond the Project Area within the region that influence fire behavior and fire spread.

Proposed Project. The Proposed Project is the applicant's ownership as depicted in Figure 1. The specific plan for the Proposed Project is titled "Otay Ranch Village 14 and Planning Areas 16/19 Specific Plan." The Proposed Project includes a Specific Plan, General Plan Amendments, an environmental impact report (EIR), a rezone, a Tentative Map, and an Otay Ranch Resource Management Plan (RMP) Amendment. The Proposed Project is further defined in Chapter 1, Project Description, of the EIR, which is incorporated herein by reference. Except for the off-site areas described below, the Proposed Project specifically excludes California's ownership in Village 14 and Planning Area 16, which remains approved for development per the County's General Plan and the Otay Ranch GDP/SRP. The underlying County General Plan and Otay Ranch GDP/SRP land uses on the state's property would remain unchanged. In addition, the "Inverted L" is excluded from this analysis as it is not owned by the applicant and is in the City of Chula Vista, (the property is owned by Otay Water District and the U.S. Fish and Wildlife Service).

Otay Ranch Village 14. "Otay Ranch Village 14" or "Village 14" as referred to herein is a discrete subset of the Proposed Project and reflects approximately 723.7 acres of the applicant's ownership located exclusively within Village 14 as depicted in Figure 2. Approximately 994 homes are planned around a Village Core in this area, as shown in Table 1.

Otay Ranch Planning Areas 16/19. "Otay Ranch Planning Areas 16/19" or "Planning Areas 16/19" is a discrete subset of the Proposed Project and reflects approximately 559.8 acres of the applicant's ownership located exclusively within Planning Areas 16/19 as depicted in Figure 2. Approximately 125 homes are planned on 1-acre and 3-acre-average lots in this area, as shown in Table 1. Further described below, the Limited Development Area would be 127.1 acres.

Limited Development Area. Limited Development Area (LDA) is a defined land use designation in the Otay Ranch GDP/SRP. "An open space easement will cover the areas designated as 'Limited Development Area'…These areas will be left as natural open space with the exception that roads and utilities are anticipated to cross or lie within these areas…LDAs may be included within private lots but would have the following set of restrictions. Removal of native vegetation would be prohibited except as necessary for construction of roads and utilities. There would be no buildings or other structure, agriculture, landscaping, livestock, grazing, horses, trash disposal of fences allowed within these areas." Fuel modification is allowed in the LDA as "brushing for fire control zones would conform to the local fire district regulations." A total of 127.1 acres of LDA would be provided in Planning Areas 16/19. There is no LDA in Village 14.

Otay Ranch RMP and Multiple Species Conservation Program (MSCP) Preserve. The Otay Ranch Resource Management Plan (RMP) provides for the conservation, funding and management of the entire 11,375-acre Otay Ranch RMP Preserve. The MSCP County Subarea Plan Implementing Agreement describes the County's required contribution to the MSCP Preserve. The Implementing Agreement states that the required mitigation for Otay Ranch includes "protection of the areas identified as preserved in the boundaries of the Otay Ranch project including approximately 11,375 acres" of the Otay Ranch RMP Preserve. Therefore, the Otay Ranch RMP Preserve is a subset of the MSCP Preserve.

The portion of the Proposed Project's land use designated as Otay Ranch RMP Preserve, while considered a part of the MSCP County Subarea Plan Preserve, is unique to Otay Ranch because it specifically mitigates for direct and cumulative impacts associated with implementation of the Otay Ranch GDP/SRP. The Proposed Project includes 426.7 acres of Otay Ranch RMP Preserve, of which 270.2 acres are in Village 14 and 156.5 acres are in Planning Areas 16/19.

Preserve Conveyance Obligation. To satisfy assemblage of the 11,375-acre Otay Ranch RMP Preserve ranch wide, a "Preserve Conveyance Obligation" was prescribed in the Otay Ranch RMP. The Preserve Conveyance Obligation is 1.188 acres of Otay Ranch RMP Preserve conveyed per 1 acre of development, as further defined in the adopted Otay Ranch RMP. This obligation, which is the primary basis of Proposed Project's required mitigation, may be achieved through conveyance of either the applicant's RMP Preserve ownership or through off-site acquisition within the 11,375 acres Otay Ranch RMP Preserve.

Conserved Open Space. "Conserved Open Space" refers to those areas with an Otay Ranch GDP/SRP land use designation other than Otay Ranch RMP Preserve that will be preserved on site and which will either be added to the Otay Ranch RMP Preserve (through a future RMP Amendment), managed under a separate Resource Management Plan, or utilized to mitigate impacts

to the City of San Diego MSCP Cornerstone Lands.. The approximately 72.4 acres of Conserved Open Space is composed of 31.9 acres within the 127.1 acres of LDA and 3.6 acres of residential land use designation in Planning Area 16/19 plus 36.9 acres of residential land use designation within Village 14. The Conserved Open Space areas are located adjacent to Otay Ranch RMP Preserve and will be conserved by recording a biological open space easement over the land.

Development Footprint. The Development Footprint includes areas where there would either be permanent or temporary ground disturbance. The Development Footprint includes all on-site development, off-site improvements, graded LDA, and impacts resulting from infrastructure and other allowable uses within the Otay Ranch RMP/MSCP Preserve, per Section 1.9.3 of the MSCP County Subarea Plan (County of San Diego 1997).

Off-Site Improvements. "Off-site improvements" total approximately 85.4 acres of both temporary and permanent impacts, and include the following: Proctor Valley Road, including related wet and dry utilities, drainage facilities and trails; access roads in Planning Area 16; an off-site sewer pump station in the southern reach of Proctor Valley Road and off-site sewer facilities to connect to the Salt Creek Interceptor as planned since 1994.

Proctor Valley Road improvements would include South Proctor Valley Road (0.25 miles in the City of Chula Vista land and 0.2 acres privately owned in the County); South and Central Proctor Valley Road (1.5 miles in City of San Diego Cornerstone land); Central Proctor Valley Road (0.4 miles in CDFW Otay Ranch Village 14 land); and North Proctor Valley Road (0.75 miles in CDFW Otay Ranch land between Village 14 and Planning Areas 16/19).

Proctor Valley Road Central and South are proposed to be improved and classified as a two-lane-with-median light collector with a width ranging from 68 to 74 feet, plus an additional 20-foot-wide fuel modification/construction easement on each side. Proctor Valley Road north is a two-lane interim road with a paved width of 28 feet in a 40-foot-wide right-of-way. Improvements in Proctor Valley Road would include those typically in roadways, including wet and dry utilities, a sewer pump station, drainage, landscape, culverts, and trails. Proctor Valley Road is an approved County General Plan mobility element road and an approved facility in the MSCP County Subarea Plan.

In addition, there are three public off-site roads within Planning Area 16. These roads are located primarily within CDFW managed lands and are approved in the Otay Ranch GDP/SRP as facilities within designated development or LDA land use, (and are also approved facilities per the MSCP County Subarea Plan Section 1.9.3.3 (County of San Diego 1997)). Improvements in these off-site roads would include those typically in roadways, including wet and dry utilities, drainage, landscape, culverts, and trails.

1.4 Proposed Specific Plan

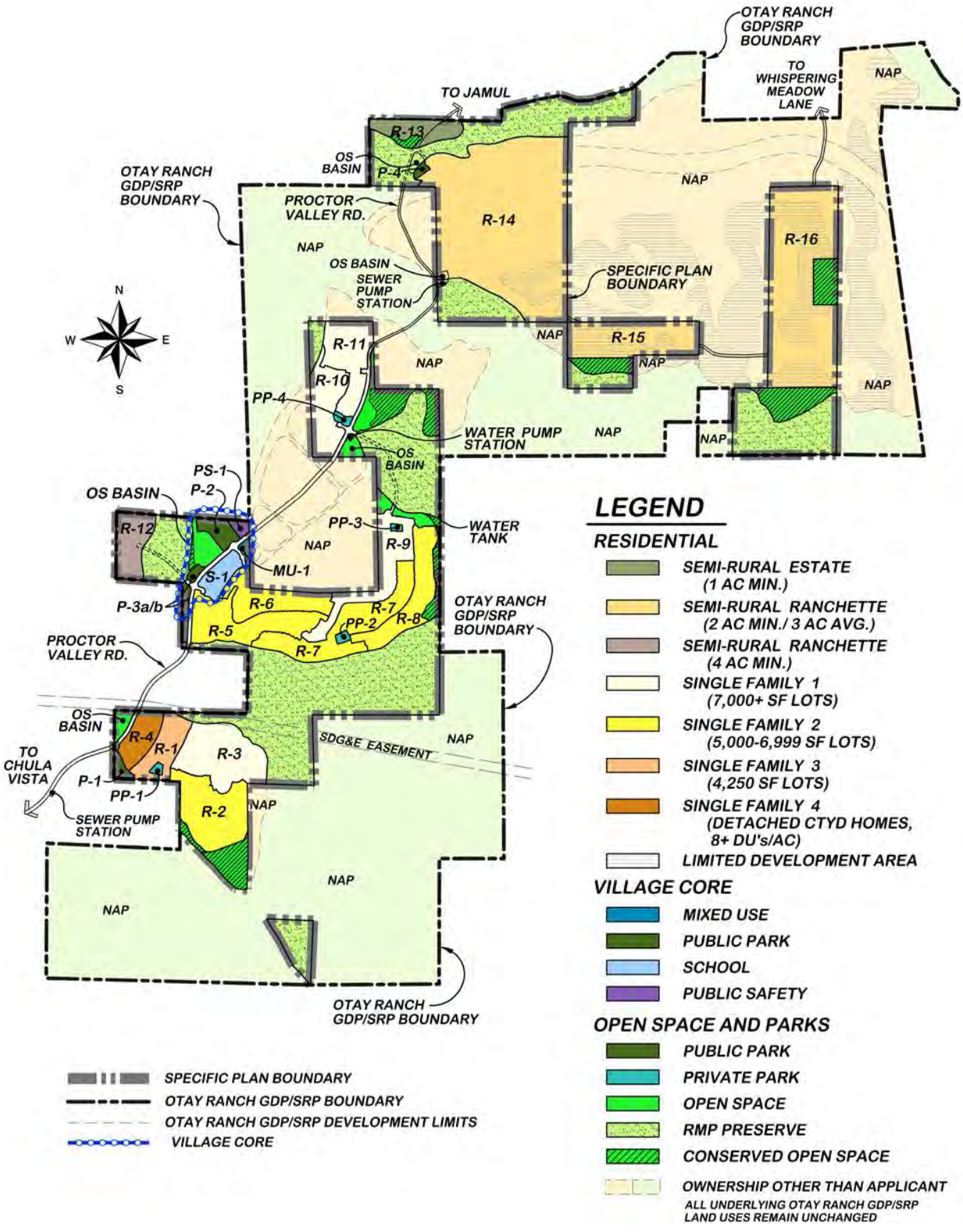
1.4.1 Summary

The adopted Otay Ranch GDP/SRP requires the preparation of a Specific Plan, which includes a Site Utilization Plan to describe the land uses for the Proposed Project. Figure 3 depicts the proposed Site Utilization Plan.

Approximately 994 homes are planned in Village 14, set in three distinct areas (referred to herein as the South, Central, and North Village 14) 878 of which would be single-family homes located in gated enclaves and 116 would be detached courtyard homes clustered around a common driveway. Twelve neighborhoods are planned with approximate densities ranging from 0.2 to 10.0 dwelling units per acre. Otay Ranch Village 14 is planned around a "Village Core", centrally located in the heart of the village. The Village Core would be composed of a 9.7-acre elementary school, a 7.2-acre Village Green (public park), a 1.7-acre mixed-use site with up to 10,000 square feet of commercial/retail uses, and a 2.3-acre public safety site for a fire station and satellite sheriff's facility. Additional public and private parks, swim clubs, trails, and recreational facilities would be situated throughout South, Central, and North Village 14. See Table 1 for detailed land uses in Village 14.

In addition to the homes in Village 14, there are 13 one-acre average sized estate lots proposed in Planning Area 19 and 112 three-acre average sized ranchettes in Planning Area 16. Planning Areas 16/19 neighborhoods would not be gated neighborhoods. The LDA may include public infrastructure, and/or be conserved within private lots with a conservation easement. See Table 1 for detailed land uses in Planning Areas 16/19.

The Proposed Project's Specific Plan is designed around an active lifestyle and wellness recreation theme and includes a park and recreation system including four public parks totaling approximately 15.2 acres. The remaining private recreation facilities include three private swim clubs, and numerous pocket parks totaling approximately 9.5 acres. An approximately 4.5 mile, 10-foot-wide decomposed granite Community Pathway is proposed along Proctor Valley Road from Chula Vista to Jamul. The Proposed Project includes approximately 27.6 acres of open space (exclusive of the 110.1 acres of open space included in the residential gross acres), 127.1 acres of LDA, and 426.7 acres of Otay Ranch RMP Preserve within the applicant's ownership. Of note, there is approximately 72.4 acres of Conserved Open Space within the Proposed Project that will be conserved by recording a biological open space easement.



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SOURCE: Hunsaker 2018

FIGURE 3

Proctor Valley Site Utilization Plan

Otay Ranch Village 14 and Planning Areas 16/19

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1.4.2 Circulation and Access

Regional access to Otay Ranch Village 14 is provided by SR-125, located approximately 3 miles to the west. Interstate (I) 805, approximately 8 miles to the west, provides secondary north/south access. SR-54, located approximately 6 miles to the northwest, connects to SR-125 and I-805, and provides regional east/west access. SR-94, located approximately 3 miles to the northeast, provides access from the east through the Jamul community.

Proctor Valley Road would provide the main access to the Proposed Project. Four roundabouts in Village 14 and one roundabout in Planning Areas 16/19 would identify the entrance into each residential area as well as provide traffic calming at key internal intersections. The internal circulation plan also includes a series of collectors and residential streets to provide access to the residential neighborhoods; with Planning Areas 16/19 designed to County Rural Road Standards. A secondary access to the easternmost portion of Planning Area 16 is the planned extension of existing Whispering Meadows Lane.

Proctor Valley Road is planned as a two-lane mobility element road and is designated as a scenic corridor. The northern connection of Otay Ranch Village 14 to the community of Jamul would remain substantially in the alignment of the existing partially improved Proctor Valley Road and would be paved to provide both public and emergency access for the Proposed Project as well as for the community of Jamul.

1.4.3 Public Services

An overview of public services is provided as follows:

Sewer: Capacity would be provided by the County through annexation into the County Sanitation District. Sewer transportation would be provided by conveying flows to the City of Chula's Salt Creek Interceptor pursuant to agreements between the City and County. Sewer would be provided in Village 14 and Planning Areas 16/19 per the Otay Ranch GDP/SRP and adopted sewer agreements. The Proposed Project includes sewer trunk line extensions and pump, or lift stations.

Water: The Proposed Project is located within the Otay Water District boundary and is already accommodated in the Otay Water District Water Resources Master Plan. A 980-pressure zone water tank adjacent to Central Village 14 is planned on site. The Proposed Project includes water transmission lines, a 980 reservoir and pump stations.

Law Enforcement: County Sheriff's office would provide law enforcement services and have a storefront facility co-located with the fire station at the public safety site in the Village Core.

Fire: Fire service would be provided by SDCFA from a fire station built within the Proposed Project's public safety site in the Village Core.

Stormwater/Drainage: Biofiltration basins are planned to handle the Proposed Project runoff and treat stormwater and site drainage prior to discharging into the natural drainages.

Schools: Village 14 is planned to be served by the Chula Vista Elementary School District and Sweetwater Union High School District. Planning Areas 16/19 are planned to be served by the Jamul/Dulzura Union School District and the Grossmont High School District as prescribed in the adopted Otay Ranch GDP/SRP Facilities Implementation Plan and consistent with County Board of Supervisors Policy I-109, Policy II.

1.5 Proctor Valley Road North and Trails Options

The Proposed Project includes three options for internal circulation: (1) the Proctor Valley Road North Option, (2) the Preserve Trails Option, and (3) the Perimeter Trail Option. The Draft EIR assesses each of these options and their respective impacts. This would allow the County Board of Supervisors to select the option (or combination of options) it considers best for the Proposed Project and the environment. Each of the options is summarized below. For detailed descriptions with figures, see the Specific Plan Section VIII Internal Circulation Options (RH Consulting 2018).

Proctor Valley Road North Option: The Proctor Valley Road North Option applies to the portion of Proctor Valley Road from Street AA in the North Village to Echo Valley Road. This option includes two dedicated bike lanes (one on each side of the road) instead of the "sharrows" (road markings that guide bicyclists to bike routes between neighborhoods and alert motorists to the presence of bicyclists within the shared travel lane) proposed in street section 10 of the Proposed Project. Generally, the Proctor Valley Road North Option would increase the right-of-way width from 40 feet to 64 feet starting from the intersection of Street AA northward to the applicant's Village 14 ownership boundary; from 40 feet to 48 feet within the off-site improvement area owned by the state; and from 40 feet to 64 feet on site within the applicant's ownership north of the state's property to Echo Valley Road.

Preserve Trails Option: The Preserve Trails Option consists of two segments of existing, disturbed trails approximately 1 mile in length within the Project Area, east of the Development Footprint. These segments would be located within the Otay Ranch RMP Preserve. The Preserve Trails Option includes segments "A" and "B" as identified in the Otay Ranch GDP/SRP, which are also identified as segments 52 and 49 in the County's Community Trails Master Plan (CTMP). Segment "A"/"52" is 2,350 lineal feet, located at the northern terminus of the Proctor Valley Community Pathway and extending east through the on-site Otay Ranch RMP Preserve to

the eastern edge of the Echo Valley loop (CTMP Trail 53). Segment "B"/"49" is 2,328 lineal feet and is located between South and Central Village 14, along an existing, historic ranch road. This trail is located within on-site Otay Ranch RMP Preserve and bisects regional wildlife corridor R1. The Preserve Trails Option would retain these portions of trails in their existing conditions, which meet the CTMP primitive trail standard. No improvements to these Preserve Trails are proposed.

Perimeter Trail Option: The Perimeter Trail Option is an approximately 3.6-mile perimeter trail located within the Development Footprint of South and Central Village 14. The Perimeter Trail Option is situated primarily within the Otay Ranch RMP 100-foot Preserve Edge. The Perimeter Trail Option is designed to CTMP primitive trail standards, and the trail tread varies from 2 to 6 feet. Due to topography, trail grades range from 2% to the maximum grade allowed of 30%. The Perimeter Trail Option requires the construction of approximately 19,000 linear feet (0.7 miles) of 5- to 7-foot-high retaining walls due to steep topography and drainage constraints. The Perimeter Trail Option would be graded as part of overall project grading and does not encroach into the Otay Ranch RMP Preserve. The perimeter trail would be accessed at public parks and trailheads and would be maintained by the County.

Dudek has evaluated these options and determined they are not material to the information presented in this analysis because they do not effect fire protection planning.

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2 PROPOSED PROJECT STUDY AREA RISK ANALYSIS

2.1 Field Assessment

Following review of available digital Study Area information, including topography, vegetation types, fire history, and the Proposed Project's Development Footprint, Dudek fire protection planners conducted a field assessment of the Study Area on April 27, 2015. Dudek's assessment was aided by Dudek's biologists who conducted a comprehensive vegetation mapping assignment on the Study Area over the course of several weeks in 2015 and 2016 (Dudek 2017).

Among the field tasks completed were the following:

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

Study Area photographs were collected (Appendix A), and fuel conditions were mapped using aerial images. Field observations augmented existing Study Area data in generating the fire behavior models and formulating the requirements provided in this FPP.

2.2 Study Area Characteristics and Fire Environment

The following sections discuss the characteristics of the Study Area at a regional scale. Evaluating conditions at this macro-scale provides a better understanding of the regional fire environment, which represents the fuel bed for wildfires that may ignite in the vicinity of, and burn toward, the Proposed Project's planned and maintained fire buffers, landscapes, and ignition-resistant structures.

2.2.1 Topography

Topography influences fire risk by affecting fire spread rates. Typically, steep terrain results in faster fire spread up-slope and slower spread down-slope. Terrain that forms a funneling effect, such as chimneys, chutes, or saddles on the landscape can result in especially intense fire behavior. Conversely, flat terrain tends to have little effect on fire spread, resulting in fires that are driven by vegetation and wind.

The Proposed Project's topography in its current condition is diverse and characterized by a relatively flat valley along Proctor Valley Road and broad gentle hillsides within the remainder of the Development Area (within approximately 300 feet of the Proposed Project's Development Footprint). Areas outside this Development Footprint include steeper terrain. The Project Area is bordered by increasingly rugged terrain of the San Miguel and Jamul Mountains immediately to the northwest and southeast, respectively, with the foothills of these mountains extending into the Village 14 Project Area. These slopes are predominantly up and away from the Proposed Project's Development Footprint. Several small, narrow drainages are present along the eastern edge of the Development Footprint. A low east/west-trending ridgeline effectively divides Proctor Valley near the upper end of the proposed Study Area.

Elevations of the Study Area range from approximately 600 feet above mean sea level (amsl) at the southern end of the property to approximately 1,300 feet amsl in the northeastern portion of the Study Area in Planning Areas 16/19. Although slopes can range from 5% up to 40% within the Study Area, the Proposed Project's average slope[2] to approximately 300 feet outside the perimeter of the Development Footprint is approximately 19.5%. Slope is important relative to wildfire because steeper slopes typically facilitate more rapid fire spread up slope. In the case of the Study Area, the steeper slopes are primarily within the areas designated as Otay Ranch RMP/MSCP Preserve and would not be developed. The Study Area's steeper slopes ascend away from the developed areas of the Proposed Project in Village 14 (versus situations where development occurs at top of slope and the terrain descends away from the developed areas). Planning Areas 16/19 terrain includes a variety of drainages and slopes that ascend or descend from the Proposed Project's lots. The Study Area's topography is generally in alignment with the extreme Santa Ana wind events, which can influence fire spread by creating wind-driven fires, especially when moving upslope.

2.2.2 Climate

Southwestern San Diego County, including the Project Area, is influenced by the Pacific Ocean and frequently under the influence of a seasonal, migratory subtropical high-pressure cell known as the "Pacific High" (WRCC 2014a). Wet winters and dry summers with mild seasonal changes characterize the Southern California climate. Local climate, which has a large influence on fire risk, is typical of a Mediterranean area. The climate pattern is occasionally interrupted by extreme periods of hot weather, winter storms, or dry, easterly Santa Ana winds (WRCC 2014a) The average high temperature for the Study Area during fire season is approximately 83°F, with

[2] The average slope within 300-foot perimeter buffer was calculated by Hunsaker and Associates using formula from San Diego County's S-1 Policy (2015).

temperature in summer and early fall months (July–October) reaching up to 102°F. Precipitation typically occurs December through April, with annual rainfall ranging from 3.5 to 13.3 inches (2012–2014), with lower annual accumulation (3.5–5.2 inches) in 2015 due to the current drought (DWR 2015; WRCC 2014b). The prevailing wind is an on-shore flow from the Pacific Ocean, which is approximately 13 miles to the west. Hot, dry (Santa Ana) winds, which typically occur in the fall and are usually from the northeast, can gust to 50 mph or higher. The Santa Ana winds are due to the pressure gradient between high pressure in the plateaus of the Great Basin and lower pressure gradient over the Pacific Ocean (NOAA 2007). Drying vegetation (fuel moisture of less than 5% for 1-hour fuels is possible) during the summer months becomes fuel available to advancing flames should an ignition occur. Extreme conditions, used in fire modeling for this Proposed Project, include 92°F temperatures in summer and winds of up to 50 mph during the fall. Relative humidity of 12% or less is possible during fire season.

2.2.3 Fuels (Vegetation)

The Project Area is currently undeveloped and is composed of a variety of vegetation types that were mapped by Dudek (Dudek 2017). Extensive vegetation type mapping is useful for fire planning because it enables each vegetation community to be assigned a fuel model, which is used by a software program to predict fire characteristics, as discussed in Section 4.1, Fire Behavior Modeling. The Study Area's vegetative fuels are primarily non-native grassland, chaparral, and coastal sage scrub, although smaller pockets of eucalyptus woodland, oak riparian forest, marsh, wetland, and ornamental vegetation types are present. This vegetation is adapted to periodic wildfire events. Fire history data described in Section 2.2.6, Fire History, indicates that the vegetation last burned in 2007 on the majority of the Project Area. As such, the vegetation on the property is still in early stages of recovery toward a climax species composition. Small areas of disturbed habitat and urban/developed land cover types are also present within the Study Area. More detailed information regarding the plant communities within the Study Area is provided in the Biological Resources Technical Report for the Proposed Project (Dudek 2017). Vegetation is important relative to wildfire, as some vegetation such as coastal sage scrub and grassland habitats are highly flammable, and other vegetation such as oak riparian forest is less flammable due to its higher moisture content, but will burn under certain, more intense fire conditions.

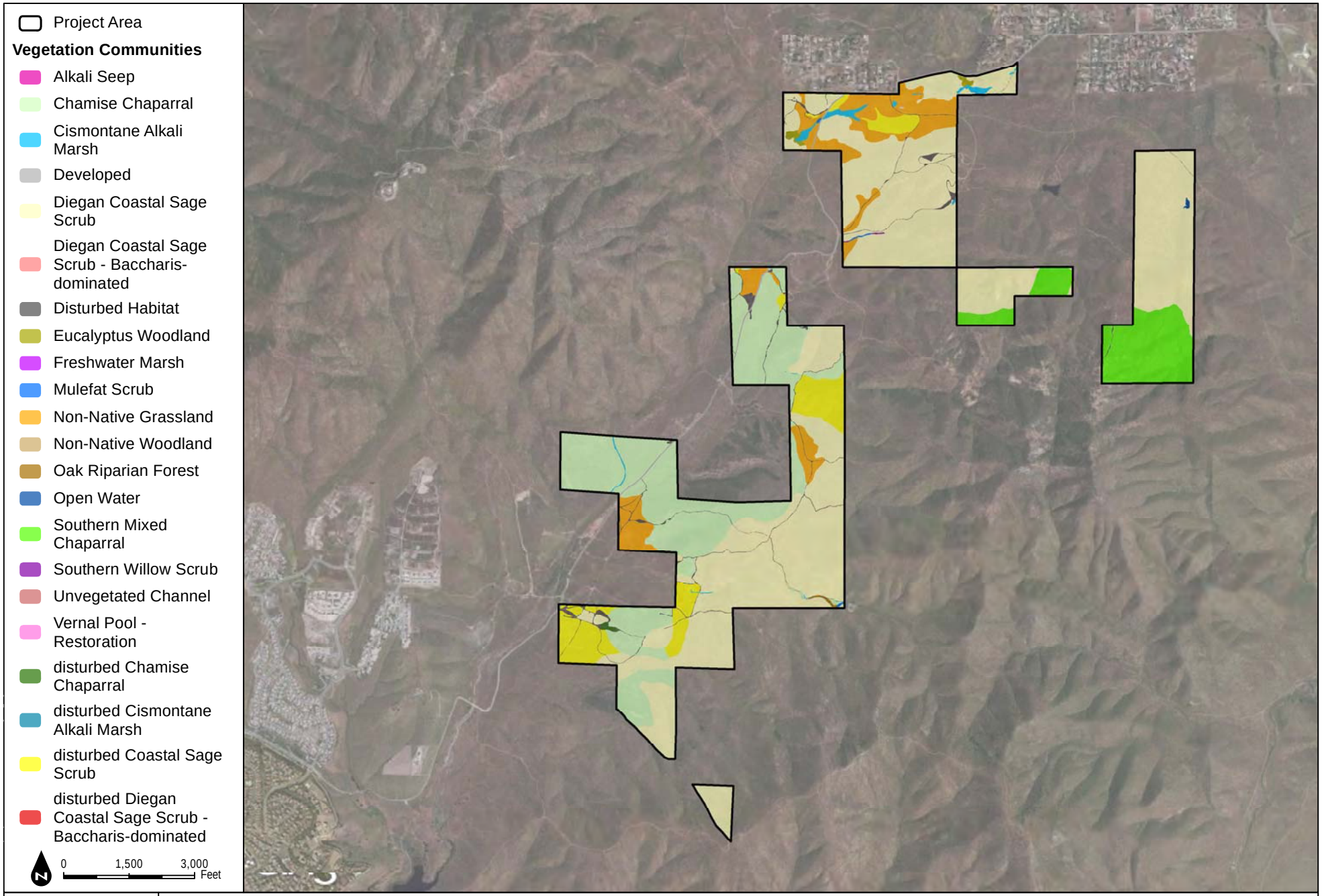
The Development Footprint would be converted to roads, structures, and landscape vegetation following the Proposed Project's completion. Any native vegetative fuels within FMZs would also be modified as a result of development, altering their current densities, distributions, and species composition. Areas that would have the most influential on development related to direct fire impacts (approximately 300 feet outside of proposed development) and FMZs would continue to be dominated by chamise-chaparral, southern mixed chaparral, Diegan coastal sage scrub, and non-native grassland fuel beds. These vegetation types were confirmed by Dudek fire

protection planners in the field and assigned fuel models for use during fire behavior modeling (see Section 4.1.1). These fuels are anticipated to remain in the areas adjacent to the Development Footprint (just outside the FMZs) but have been planned and compensated through a system of fire protection described throughout this FPP.

2.2.4 Fuel Loads

The vegetation along the perimeter of the development and within approximately 300 feet of the FMZs is the area of highest concern for determining what effects wildfire may have on the Proposed Project's landscape and structures. It is these fuels that, if ignited, would burn up against the provided FMZs and alternative protections, designed to reduce flame length, spread, and intensity as it gets closer to the built portions of the Proposed Project. Vegetation types in these areas have been classified into fuel models used for fire behavior modeling, discussed in Section 4, Anticipated Fire Behavior, of this FPP (Figure 4, Vegetation Map). The importance of vegetative cover on fire suppression efforts is its role in affecting fire behavior. For example, although fires burning in grasslands may exhibit lower flame lengths than those burning in chaparral fuels, fire spread rates in grasslands are often much more rapid than those in other vegetation types.

Fuel loading in non-native grassland is estimated to be 0.4 tons per acre, and that in chaparral-sage scrub is estimated between 8.4 and 8.6 tons per acre (Brown 1982; Scott and Burgan 2005; Weise and Regelbrugge 1997). The fuel load is the amount of fuel available to wildfire. Shrub-dominated plant communities tend to include higher fuel loads than grass-dominated plant communities. Tree-dominated communities may include higher fuel loads than shrub-dominated landscapes. However, there are many other facets of fire behavior that govern fire ignition and spread. Therefore, because an area may include higher fuel loads, it does not necessarily mean that it presents a higher fire risk.



SOURCE: Bing Maps (Acccessed in 2016), Hunsaker 2015

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FIGURE 4

Vegetation Map

Otay Ranch Village 14 and Planning Areas 16/19

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2.2.5 Vegetation Dynamics

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 in the Study Area 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, although 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, and fire exclusion tends to convert grasslands to shrublands over time as shrubs sprout back or establish and are not disturbed by repeated fires. 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 FMZs. The FMZs would consist of irrigated and maintained landscapes and thinned native fuel zones that would be subject to regular "disturbance" in the form of maintenance and would not be allowed to accumulate excessive biomass over time, which results in reduced fire ignition, spread rates, and intensity.

Conditions adjacent to the Proposed Project's footprint (outside the FMZs), where the wildfire threat would exist post-development, are currently classified as low to moderate fuel loads due to the higher percentage of grasslands intermixed with sparse stands of chamise chaparral and coastal sage scrub fuels. However, climax vegetation state (undisturbed brush stands that are not disturbed for an extended period 50 years or more) includes more uniform and dense stands of sage scrub-chaparral fuels, which were employed for a conservative modeling approach to represent worst-case (i.e., max fuels) wildfire scenarios around the perimeter of the Project Area.

2.2.6 Fire History

Fire history is an important component of FPPs. Fire history data provides valuable information, including fire spread, fire frequency, most vulnerable areas, and significant ignition sources. 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. There have been 68 fires recorded by CAL FIRE since 1910 on their Fire and Resource Assessment Program database within 5 miles of the Proposed Project (FRAP 2015). The total of 68 fires in this area over the last 105 years within 5 miles of the Proposed Project is not considered a high number for Southern California. On average, CAL FIRE annually responds to 5,000 wildfires of more than 10 acres (CAL FIRE 2015). Of the 68 fires that have burned within 5 miles of the Proposed Project, there have been 17 fires that burned portions of the Proposed Project property. The most notable fire (Harris Fire) occurred in October 2007, and burned approximately 90,440 acres in the southwestern portion of the County, including a large portion of the Project Area. SDCFA may have data regarding other smaller, undocumented fires that have occurred on the Project Area and within the Study Area that have not been included herein because fires under 10 acres are not recorded by CAL FIRE. Appendix B, Fire History Exhibit, presents fire history within 5 miles of the Project Area and provides a graphical representation of the quantity of times the landscape has burned in the area. Recorded fires since 1910 that have burned onto the Project Area are listed in Table 2.

Table 2
Fire History in the Proposed Project Area

Fire Year[a]	Fire Name	Total Area Burned (acres)
1910	Unnamed	9,218
1911	Unnamed	32,308
1950	Wet Back	18,192
1968	Proctor	10,617
1970	Laguna	175,425
1980	Otay No. 6	13,059
1980	Proctor	9,996
1981	Proctor No. 1	2,523
1981	Proctor No. 2	413
1984	Proctor	11,604
1985	Miller	32,414
1989	Proctor No. 7	2,423
1999	Proctor	7,004
2003	Mine/Otay	46,291
2005	Proctor	204

Table 2
Fire History in the Proposed Project Area

Fire Year[a]	Fire Name	Total Area Burned (acres)
2006	Proctor	54
2007	Harris	90,440

[a] Based on polygon GIS data from CAL FIRE's Fire and Resource Assessment Program, which includes data from CAL FIRE, U.S. Department of Agriculture Forest Service Region 5, Bureau of Land Management, National Park Service, 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 1878–2013.

Based on fire history data for the vicinity, fire return intervals range between 2 and 15 years, indicating the wildfire potential in the region and the potential for the Project Area to be subject to occasional wildfire encroachment, most likely from the large expanses of open space to the north and east. Note that once the Proposed Project is built out, the fire spread patterns would be modified in this valley, as the Proposed Project would represent large fuel breaks of maintained and irrigated landscapes, which fire may encroach upon and burn around, but would not burn through the valley with the same spread patterns as it has in the past. Although the Harris Fire burned through the Project Area in 2007, the homes in Rolling Hills Ranch, San Miguel Ranch, and built portions of Bella Lago to the southwest of the Project Area were not impacted.

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3 DETERMINATION OF PROPOSED PROJECT EFFECTS

An FPP provides an evaluation of the adverse environmental effects a project may have from wildland fire. The FPP must identify mitigation for identified impacts to ensure development does 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 wildland are adjacent to urbanized areas or where residences are intermixed with wildland?

The wildland fire risk in the vicinity of the Project Area has been analyzed according to San Diego County Guidelines for Determining Significance – Wildland Fire and Fire Protection (County of San Diego 2010). It has been determined that wildfires may occur in wildland areas that surround the Project Area but would not be significantly increased in frequency, duration, or size with the construction of the Proposed Project. The Proposed Project would include conversion of fuels to maintained development with designated SDCFA review of landscaping, FMZs, and highly ignition-resistant structures; a funded entity to manage and maintain the FMZ; and third-party annual FMZ inspections to confirm the FMZ areas are maintained as designed and, therefore, would function as intended. As such, the Development Footprint would be largely converted from readily ignited fuels to ignition-resistant landscape and structures that are provided defensible space consistent with State of California and County standards, access for firefighters and early evacuations, water and fire flow to code, and other fire protection features, as described throughout this FPP.

Ignition-Resistant Structures

The ignition-resistant requirements for new communities built in high or very high fire hazard severity zones have been determined by state and local fire agencies to provide acceptable resistance to ignition from the types of wildland fires produced by the County's wildland fuels, terrain, and weather. San Diego County conducted after-fire assessments that strongly indicate that the building codes are working in preventing home loss. Of the 15,000 structures within the 2003 Cedar Fire perimeter, 17% (1,050) were damaged or destroyed. However, of the 400 structures built to the 2001 codes (the most recent at the time), only 4% (16) were damaged or destroyed. Further, of the 8,300 homes that were within the 2007 Witch Creek Fire perimeter, 17% were damaged or destroyed. Only 3% of the 789 homes that were built to 2001 codes were impacted, and only 2% of the 1,218 structures built to the 2004 codes were impacted (IBHS 2008). Many of the newer structures that were lost were due to human error. Similarly, of 194 structures lost or damaged in the Orange County Freeway Complex Fire (2008), there were no

structures within the fire perimeter lost that were built to at least the 1996 special fire area codes (similar to the CBC Chapter 7-A requirements) enacted by the City of Yorba Linda (Orange County Fire Authority 2008). Those codes required structure hardening against wildfire, but were less restrictive and result in less ignition-resistant structures than current San Diego County Building and Fire Code requirements. Structures built to the 2016 Fire and Building Codes result in highly ignition and ember resistant structures. When combined with maintained FMZs, fire apparatus access, water (fire flow), and an equipped and trained responding fire agency, the result is a defensible project.

Effective Fuel Modification Zones

Provisions for modified fuel areas of at least 100 feet separating wildland fuels from structures have also reduced the number of fuel-related structure losses by providing separation between structures and heat generated by wildland fuels. FMZs of 100 feet in width that are correctly designed, installed, and maintained over time have been shown to provide effective defensible space.

As such, most of the primary components of the layered fire protection system provided for the Proposed Project are required by SDCFA. However, they are worth listing because they have been proven effective for minimizing structural vulnerability to wildfire. In addition, interior fire sprinklers, which would be provided in all structures (now required by code), have a track record of extremely high reliability (Bukowski et al. no date) approaching 98%, and statistics indicate that fires in homes with sprinklers resulted in 82% lower property damage and 68% lower loss of life (Hall 2013). Although not designed for wildland fire defense, should embers succeed in entering a structure, sprinklers provide an additional layer of life safety and structure protection.

Even though these measures are now required by the latest Building and Fire Codes, at one time, they were used as mitigation measures for buildings in WUI areas, because they were known to reduce structure vulnerability to wildfire. These measures performed so well, they were adopted into the 2007 California Building Code and have been retained and enhanced in code updates since then. The following Proposed Project features are required for new development in WUI areas and would form the basis of the system to provide adequate access by emergency responders and provide the protection necessary to minimize structural ignitions:

- Application of the latest adopted ignition-resistant building codes
- Exterior wall coverings are to be non-combustible or ignition resistant
- Multipane glazing with a minimum of one tempered pane
- Ember-resistant vents (recommend BrandGuard, O'Hagin, or similar vents)
- Interior, automatic fire sprinklers to code for occupancy type

- Modern infrastructure, access roads, and water delivery system
- Maintained FMZs
- Fire apparatus access roads throughout the Project Area's developed areas

Ignition Sources

The types of potential ignition sources that currently exist in the area include overhead power lines, vehicles, roadways, and neighboring residential neighborhoods. The Proposed Project would introduce potential ignition sources, particularly more people in the area. However, mitigating this increase in potential ignition sources, the Proposed Project would convert more than 750 acres of ignitable fuels to lower flammability landscape and include better access throughout the Development Footprint, managed and maintained landscapes, and consistent human presence in the area, which would ~~reduce~~ not increase the likelihood of arson, off-road vehicle-related fires, or shooting-related fires. In addition, the Proposed Project would include a fire station, apparatus, and staffing that would be able to respond quickly to reported fires.

The FMZs are designed to not only minimize wildfire encroaching upon the community, but also to minimize the likelihood that an ignition from the developed area spreads into the Otay Ranch RMP/MSCP Preserve by separating the unmaintained vegetation occurring outside the FMZs with that in the FMZs. Vegetation within the FMZs would be maintained and the first 50 feet irrigated, resulting in high fuel moisture, which is more difficult to ignite (USFS 2015); reduced fuel densities; lack of fuel continuity; and a reduction in the receptiveness of the landscape to ignition and fire spread. Fires from off site would not have continuous fuels across the Development Footprint and would, therefore, be expected to burn around and/or over the developed landscape via spotting. Burning vegetation embers may land on Proposed 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 and venting that would be used within the Proposed Project and the ongoing inspections and maintenance that would occur in the Proposed Project's landscaped areas and FMZs.

The Proposed Project would comply with the applicable fire and building codes and would include a layered fire protection system designed to current codes and inclusive of Project Area-specific measures that would result in a Proposed Project that is less susceptible to wildfire than surrounding landscapes and that would facilitate firefighter and medical aid response. These features combined with the ignition resistance construction required result in consistency with San Diego County Guidelines and a resulting acceptable fire hazard risk.

Would the project result in inadequate emergency access?

The Proposed Project would not result in inadequate emergency access. The proposed internal looped roadways meet County standards and provide emergency access over the roadways that include a minimum of 24 feet (two 12-foot-wide, unobstructed travel lanes) and additional width for parking. Additionally, the roads would provide residents the option to evacuate from at least two egress access points in two different directions from each neighborhood. Depending on the nature of the emergency, residents can exit to the north/northeast (towards Jamul) or to the south (towards Chula Vista) on Proctor Valley Road. In emergencies where it is safer to remain within the developed portions of the Project Area, temporary refuge within Village 14 would be possible as a last resort, if evacuation was considered unsafe, given the large area of developed landscape that would result from the Proposed Project's construction. The internal roadways from the residences to Proctor Valley Road would be provided fuel modified passageways. Portions of Proctor Valley Road to the north and south of the Proposed Project's developed areas would traverse through areas with natural vegetation (consistent with current fuels). The Proposed Project would provide a minimum of 20 feet of modified fuel areas along both sides of the road to provide a buffer that would act to reduce ignitions from vehicle-related causes and provide set back from wildland fuels. Similarly, connector roads between neighborhoods in Planning Areas 16/19 would include 50-foot-wide FMZs (exceeding the code requirement) on both sides of the roads.

Evacuation would be focused on early evacuations, long before fire was in the area, following the "Ready, Set, Go!" model, or else contingency options that would be available to this Proposed Project may be determined to be safer than evacuating by responding fire and law enforcement personnel. A Wildland Fire Evacuation Plan was prepared for the Proposed Project and would be provided to the residents so that all residents are aware of the evacuation routes, the fluidity of wildfire events, and the options that may be presented to them by responding law enforcement and/or fire personnel, Reverse 911, or other officials. An annual evacuation awareness program would be conducted, and online access to fire awareness educational material would be provided on the community's website.

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 Proposed Project is projected by call volume analysis (using San Diego County per-capita call generation factor of 82 calls per 1,000 persons) to add approximately 338 calls per year to

the SDCFA's existing call load. This call volume (0.9 calls per day) is not considered enough of an increase to require additional resources. However, to meet the County's General Plan 5 emergency minute travel time standard, the Proposed Project would require the provision of a new fire station within the Project Area. With the new fire station, SDCFA has indicated it can and would serve the Proposed Project (Appendix C). This fire station would be a residential fire station with two engine bays meeting SDCFA's current configuration standards for this type of facility, and the Proposed Project would provide a fire engine (Type I or II) to SDCFA's specifications. Staffing would include two career firefighter positions and one reserve until a threshold is reached where a third career position can be financed, and the reserve firefighter position would continue for a 4.0 staffing.

Interim fire protection during construction would be provided by Station 36 or possibly by a temporary station. The permanent fire station was planned for this area in the approved 1993 Otay Ranch GDP/SRP, and impacts associated with the construction and operation of the fire station have been analyzed as part of the Proposed Project's EIR and found to be less than significant after mitigation. Primary response (first in) would be provided by the Project Area's fire station. That station would be able to provide first engine response to roughly 96% of the Proposed Project's lots within the most restrictive standard of 5 minutes of travel, consistent with the San Diego County General Plan Safety Element for village and limited semi-rural residential areas. The next closest SDCFA station is Station 36, located at 14024 Peaceful Valley Ranch Road, approximately 5 miles from the midpoint of the Proposed Project along Proctor Valley Road. Station 36 can respond to a portion of the remainder of the Proposed Project's lots (approximately 1%) within 5 minutes of travel and the remainder of the lots within 6 minutes, well below the allowed 10-minute travel time allowed in the General Plan for semi-rural residential development. Station 36 averages roughly one call per day within its response area. The Proposed Project would provide funding for constructing, equipping, operating, and maintaining the new fire station. The station would be part of the proposed public safety facility, which is located in the Village Core, Central Village 14 phase.

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 Proposed Project would be served by Otay Water District and sufficient water supplies would be available to serve the Proposed Project from existing entitlements and resources. SDCFA, and the Otay Water District require new development to meet a minimum 2,500 gallons per minute (gpm) fire flow. The Proposed Project is located within the Otay Water District boundary and already accommodated in the Otay Water District master plan. A 980 (elevation zone) water tank adjacent to Central Village 14 is planned. The Otay Water District has provided a water availability/will serve form to the Proposed Project (Appendix D).

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

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4 ANTICIPATED FIRE BEHAVIOR

4.1 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 adjacent to the Development Footprint given characteristic Study Area features such as topography, vegetation, and weather. The BehavePlus 5.0.5 fire behavior modeling software package, the latest version of the industry standard fire behavior prediction software, was used in evaluating anticipated fire behavior adjacent to proposed FMZs for the perimeter of the Proposed Project's developed areas. Results are provided below, and a more detailed presentation of the BehavePlus modeling and analysis, including fuel moisture and weather input variables, is provided in Appendix E.

4.1.1 BehavePlus Fire Behavior Modeling Effort

Fire behavior results derived from the BehavePlus modeling efforts are presented in Table 3 and in Figure 5. Six focused analyses (fire scenarios) were completed, each assuming worst-case fire weather conditions for a fire approaching the Project Area primarily from the northeast or southwest. These fire scenario areas, which were directly adjacent to the FMZs and around the perimeter of the Development Footprint, were modeled as short grass (Fuel Model 1), chamise chaparral (Fuel Model SH5), or coastal sage scrub (Fuel Model SCAL 18) fuel beds. This detailed analysis compared fire behavior adjacent to the proposed development with outputs including flame length (feet), rate of spread (mph), and fireline intensity (British thermal unit (Btu) per foot per second)).

Table 3
BehavePlus Fire Behavior Modeling Results

Fire Scenario	Flame Length (feet)	Spread Rate (mph)	Fireline Intensity (Btu/foot/second)	Spot Fire (miles)
Scenario 1: 5%–20% – Flat to Upslope; Summer Weather Condition				
Short grass (FM 1)[a]	2.8	<1.0	52	0.1
Chamise chaparral (SH5)	9.1	<1.0	697	0.2
Sage scrub (SCAL18)	10.7	<1.0	984	0.3
Scenario 2: 20%–30% – Downslope; Peak Weather Condition				
Chamise chaparral (SH5)	30.2 (34.2)	3.3 (4.4)	9,372 (12,229)	1.6 (2.0)
Sage scrub (SCAL18)	30.6 (33.7)	1.6 (1.9)	9,655 (11,868)	1.6 (2.0)
Scenario 3: 10%–27% – Upslope; Peak Weather Condition				
Short grass (FM 1)	12.7 (12.7)	8.3 (8.3)	1,415 (1,415)	0.9 (1.0)
Sage scrub (SCAL18)	31.3 (34.3)	1.6 (2.0)	10,125 (12,338)	1.6 (2.0)

Table 3
BehavePlus Fire Behavior Modeling Results

Fire Scenario	Flame Length (feet)	Spread Rate (mph)	Fireline Intensity (Btu/foot/second)	Spot Fire (miles)
Scenario 4: 5%–15% – Upslope; Peak Weather Condition				
Short grass (FM 1)	12.7 (12.7)	8.3 (8.3)	1,415 (1,415)	0.9 (1.0)
Sage scrub (SCAL18)	31.0 (34.0)	1.6 (1.9)	9,888 (12,101)	1.6 (2.0)
Scenario 5: 20% – Downslope; Summer Weather Condition				
Short grass (FM 1)	3.0	<1.0	62	0.1
Chamise chaparral (SH5)	9.5	<1.0	759	0.2
Sage scrub (SCAL18)	11.1	<1.0	1,057	0.3
Scenario 6: 40% – Downslope; Summer Weather Condition				
Chamise chaparral (SH5)	7.6	<1.0	462	0.2
Sage scrub (SCAL18)	9.2	<1.0	706	0.2

Btu = British thermal unit; FM = fuel model
[a] Parentheses represents modeling results for 50 mph wind gusts.

Based on the results of BehavePlus analysis, worst-case fire behavior is expected in sage scrub-chaparral fuels along the northern and eastern edges of the proposed development during a strong (Santa Ana) wind-driven fire event (Scenarios 2, 3, and 4). Under such extreme weather conditions, flame lengths in the sage scrub-grassland fuel bed would approach 34 feet with fire spread rates ranging from approximately 4.4 mph for chamise stands and 8.3 mph for grasslands due to high winds and very low fuel moistures.

On the contrary, wildfires occurring during on-shore wind patterns are expected to be of low to moderate severity with flames lengths of 11.1 feet and slower spread rates (less than 1 mph) due to higher fuel moisture content and reduced wind speeds. Sage scrub fuel types can burn intensely and can produce a fast-spreading wildland fire under strong, dry wind patterns. This fuel type can produce higher heat intensity and higher flame lengths under strong, dry wind patterns but does not typically ignite or spread as quickly as light, flashy grass fuels.

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 would be affected by many factors, including unique weather patterns, small-scale topographic variations, or changing vegetation patterns. As such, the proposed 100-foot FMZ width would be approximately 2.5 times wider than the longest calculated flame lengths for the northeastern portion of the proposed developed area. Whereas, the 100-foot FMZ width would be approximately 9 times wider than the calculated flame lengths for a fire during on-shore weather conditions.

Table 1
BehavePlus Fire Behavior Modeling Inputs
San Miguel RAWS

Variable	50th Percentile (Onshore Flow)	97th Percentile (offshore/Santa Ana Condition)
Fire Model Runs	1, 5, 6	2, 3, 4
Fuel Model	FM1, Sh5, SCAL 18	FM1, Sh5, SCAL18
1h Moisture	8%	2%
10h Moisture	10%	3%
100h Moisture	15%	7%
Live Herbaceous Moisture	90%	60%
Live Woody Moisture	122%	92%
20-ft Wind Speed	8 mph	30-40 mph (50 mph gusts)
Wind Adjustment Factor	0.4	.04
Slope Steepness	5-40%	10-30%

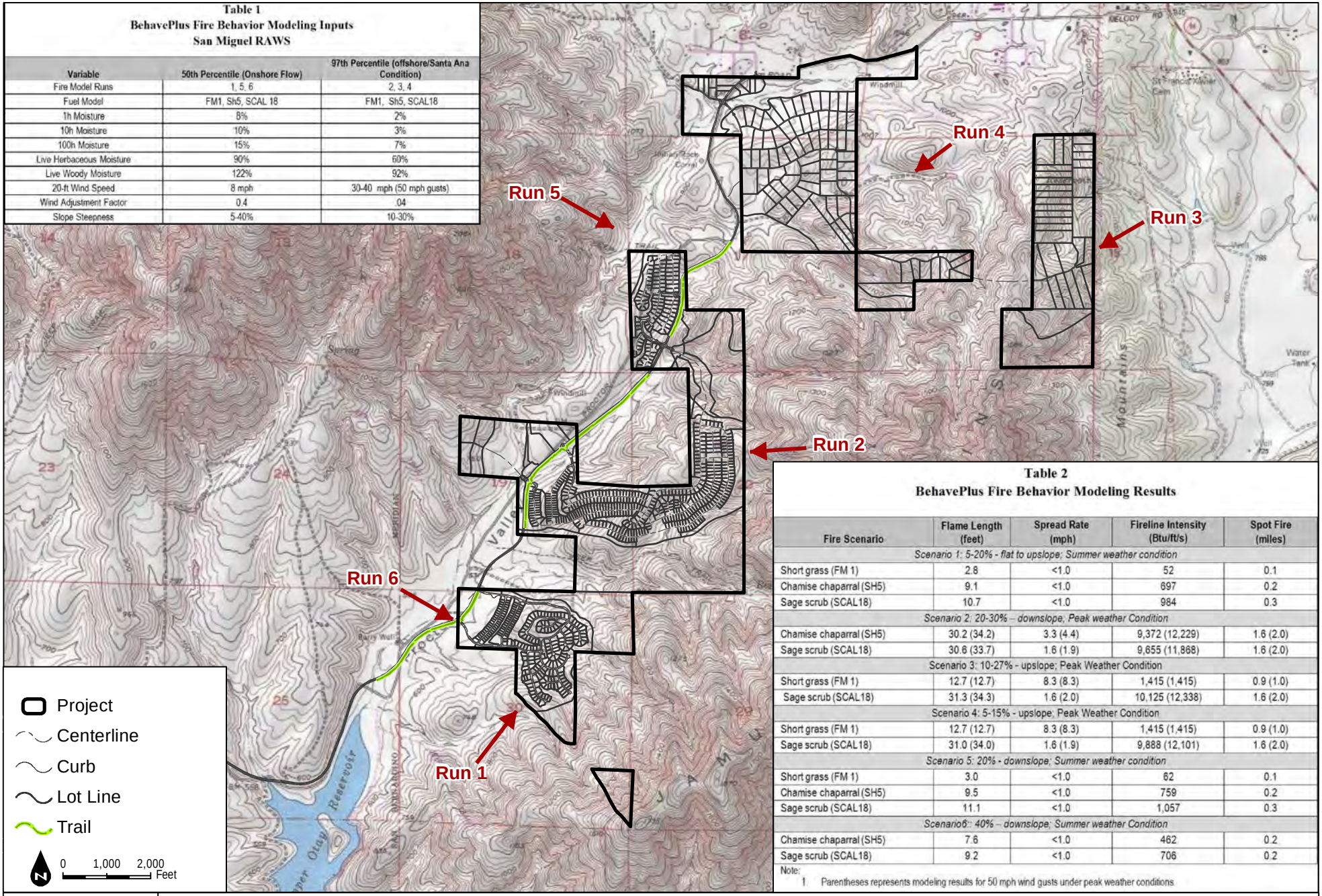

Table 2
BehavePlus Fire Behavior Modeling Results

Fire Scenario	Flame Length (feet)	Spread Rate (mph)	Fireline Intensity (Btu/ft/s)	Spot Fire (miles)
Scenario 1: 5-20% - flat to upslope; Summer weather condition				
Short grass (FM 1)	2.8	<1.0	52	0.1
Chamise chaparral (SH5)	9.1	<1.0	697	0.2
Sage scrub (SCAL18)	10.7	<1.0	984	0.3
Scenario 2: 20-30% – downslope; Peak weather Condition				
Chamise chaparral (SH5)	30.2 (34.2)	3.3 (4.4)	9,372 (12,229)	1.6 (2.0)
Sage scrub (SCAL18)	30.6 (33.7)	1.6 (1.9)	9,655 (11,868)	1.6 (2.0)
Scenario 3: 10-27% - upslope; Peak Weather Condition				
Short grass (FM 1)	12.7 (12.7)	8.3 (8.3)	1,415 (1,415)	0.9 (1.0)
Sage scrub (SCAL18)	31.3 (34.3)	1.6 (2.0)	10,125 (12,338)	1.6 (2.0)
Scenario 4: 5-15% - upslope; Peak Weather Condition				
Short grass (FM 1)	12.7 (12.7)	8.3 (8.3)	1,415 (1,415)	0.9 (1.0)
Sage scrub (SCAL18)	31.0 (34.0)	1.6 (1.9)	9,888 (12,101)	1.6 (2.0)
Scenario 5: 20% - downslope; Summer weather condition				
Short grass (FM 1)	3.0	<1.0	62	0.1
Chamise chaparral (SH5)	9.5	<1.0	759	0.2
Sage scrub (SCAL18)	11.1	<1.0	1,057	0.3
Scenario6:: 40% – downslope; Summer weather Condition				
Chamise chaparral (SH5)	7.6	<1.0	462	0.2
Sage scrub (SCAL18)	9.2	<1.0	706	0.2

Note:
1 Parentheses represents modeling results for 50 mph wind gusts under peak weather conditions

SOURCE: Hunsaker 2015

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FIGURE 5
Fire Behavior Modeling

Otay Ranch Village 14 and Planning Areas 16 and 19

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4.2 Fire Behavior Summary

Given the history of wildfire in the vicinity of the Project Area, including the 2007 Harris Fire that burned through the Project Area, combined with topography, vegetation, climate, nearby ignition sources, and anticipated fire behavior, the Project Area, in its current, pre-project condition, is considered to be vulnerable to wildfire ignition and spread during extreme fire weather. Wildfires may start on, burn onto, or spot into the Project Area. The most common type of fire anticipated in the vicinity of the Project Area is a wind-driven fire from the north/northeast, burning in the chamise chaparral and sage scrub fuel beds on the slopes of the Jamul Mountain range into the Proctor Valley.

The post-project condition of the Project Area would modify the historic ability of fire to spread in Proctor Valley. The Proposed Project's landscaped and irrigated areas and FMZs, as well as the paved roadways and ignition-resistant structures, would result in reduced fire intensity and spread rates around the Proposed Project, creating defensible space for firefighters. The result would be improved fire safety of the Project Area with regard to fire behavior, as well as for adjacent, down-wind communities.

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5 EMERGENCY RESPONSE AND SERVICE

5.1 Existing Fire Department Response Capabilities

The Proposed Project is located within the SDCFA responsibility area. The SDCFA has identified strategic response resource positioning at the Proposed Project's fire station that would provide efficient coverage for the Proposed Project.

The City of Chula Vista provides fire service to areas west/southwest of the Project Area and has a fire station located approximately 4 miles from the Project Area. Chula Vista Fire Department has not been considered for providing fire protection services for the Proposed Project for two primary reasons: (1) the Project Area is within SDCFA jurisdictional area, an agency that has indicated it can and would serve the Proposed Project, and (2) there are no existing or planned Chula Vista Fire Stations that can meet the County's 5-minute General Plan travel time standard for any portion of the Proposed Project.

The addition of SDCFA emergency response resources within the Proposed Project would provide enhanced coverage to this portion of the SDCFA response area and is considered to also benefit the City of Chula Vista Fire Department in its eastern City areas based on existing automatic aid agreements.

Based on current resources, there are up to three staffed fire stations with three fire agencies in the area. The SDCFA is a combination fire agency that uses both paid and reserve firefighters. Initial response to the Proposed Project would be either from Station 36 or from a temporary station located within the Development Footprint. Interim response timing threshold would be determined in a fire service agreement between the Proposed Project and SDCFA and would be drafted and ready to execute prior to the Proposed Project's Board of Supervisor's hearing. Station 36 at 14024 Peaceful Valley Road in Jamul is less than 2.5 road miles from the Proposed Project's northern entrances. Station 36 has seven full-time firefighters and the following apparatus:

- One structural fire engine
- One ladder truck
- One battalion chief
- One rescue squad truck
- One paramedic ambulance
- One light and air unit

Fire Station 36 currently responds to approximately one call per day (2012 statistics). Because Station 36 cannot meet the General Plan's 5-minute travel time standard to those portions of the Proposed Project where it applies, the Proposed Project would be required and has agreed to build a station within the Development Area.

Vegetation fires require special apparatus and, depending on weather and fuel conditions, may require a significant response. SDCFA would be able to call on the Proposed Project station resources and the full CAL FIRE response weight, outlined as follows.

Proposed Proctor Valley Village 14 Station:

- Type 1 or Type II engine

Full CAL FIRE response:

- Five to 10 Type III engines (depending on dispatch level)
- Battalion chief
- Three fixed-wing aircraft (two tankers and air attack)
- Dozer
- Two hand crews
- Two helicopters

Although out of the direct protection area, the neighboring fire agency, City of Chula Vista Fire Department, includes resources that may be available to respond to emergency calls as second or third engine via the existing or an updated automatic or mutual aid agreement. Of the existing fire stations in the vicinity of the Proposed Project, Chula Vista's Fire Station 8 is the closest. Chula Vista Fire Station 8 is located at the intersection of Otay Lakes Road and Woods Drive, approximately 2.9 miles from the southern-most entrance to the Project Area. It houses a staffed engine company. This location does not allow a 5-minute travel time to the majority of the Proposed Project.

Currently, the closest ladder truck is housed at Station 36 in Jamul, approximately 2.5–6 road miles (depending on which part of the Project Area is calculated) east of the Development Footprint.

5.2 Estimated Calls and Demand for Service from the Proposed Project

As indicated in Table 4, using San Diego County Fire Agencies' estimate of 82 annual calls per 1,000 population, the Proposed Project's conservatively estimated 4,028 permanent residents, and 94 staff associated with the mixed-use areas, would generate approximately 338 calls per year (0.9 calls per day). Of these calls, at least 70% are expected to be medical emergencies and 2.3% fire-related calls, based on typical call volumes (personal experience of author working in San Diego County fire jurisdictions).

Table 4
Calculated Call Volume Associated with
Otay Ranch Village 14 and Planning Areas 16/19

Emergency Calls per 1,000	Number of Residents, Guests, and Staff[a]	Average No. Calls per Year (5,598/1,000)x82	Avg. No. Calls per Day (377/365)
82	4,122 (estimate)	338	0.9

[a] Population estimates based on 3.6 persons per residential dwelling unit for all occupancy types.

5.3 Fire Response Modeling

The San Diego County General Plan Safety Element includes travel time standards from the "Closest Fire Station" (County of San Diego 2011). Travel time does not represent total response time, which is calculated by adding the travel time to the call processing time and to the turnout/reflex time. Generally, the call processing and turnout/reflex time would add between 2 and 3 minutes to the travel time. Table 5 from the County General Plan's Table S-1 establishes a service level standard, not a requirement, for fire and first responder emergency medical services that is appropriate to the area where a development is located. Standards are intended to (1) help ensure development occurs in areas with adequate fire protection and/or (2) help improve fire service in areas with inadequate coverage by requiring mitigation for service-level improvements as part of Proposed Project approval.

Table 5
Travel Time Standards from the Closest Fire Station[a]

Travel Time	Regional Category (and/or Land Use Designation)	Rationale for Travel Time Standards[b]
5 minutes	Village (VR-2 to VR-30) and limited Semi-Rural Residential Areas (SR-1) Commercial and Industrial Designations in the Village Regional Category Development located within a Village Boundary	In general, this travel time standard applies to the County's more intensely developed areas, where resident and business expectations for service are the highest.

Table 5
Travel Time Standards from the Closest Fire Station[a]

Travel Time	Regional Category (and/or Land Use Designation)	Rationale for Travel Time Standards[b]
10 minutes	Semi-Rural Residential Areas (>SR-1 and SR-2 and SR-4) Commercial and Industrial Designations in the Semi-Rural Regional Category Development located within a Rural Village Boundary	In general, this travel time provides a moderate level of service in areas where lower-density development, longer access routes, and longer distances make it difficult to achieve shorter travel times.
20 minutes	Limited Semi-Rural Residential areas (>SR-4, SR-10) and Rural Lands (RL-20) All Commercial and Industrial Designations in the Rural Lands Regional Category	In general, this travel time is appropriate for very low density residential areas, where full-time fire service is limited and where long access routes make it impossible to achieve shorter travel times.
>20 minutes	Very-low rural land densities (RL-40 and RL-80)	Application of very-low rural densities mitigates the risk associated with wildfires by drastically reducing the number of people potentially exposed to this hazard. Future subdivisions at these densities are not required to meet a travel time standard. However, independent fire districts should impose additional mitigation requirements on development in these areas.

[a] The most restrictive standard would apply when the density, regional category, and/or village/rural village boundary do not yield a consistent response time standard.

[b] Travel time standards do not guarantee a specific level of service or response time from fire and emergency services. Level of service is determined by the funding and resources available to the responding entity.

The Proposed Project would be subject to the San Diego County General Plan 5-minute travel time standard post development based on its parcel sizes and Proposed Project densities and applying the most restrictive travel time. Village 14 would be entirely within the 5-minute travel time. However, Planning Areas 16/19 include characteristics consistent with Semi-Rural designation, which would be allowed up to 10 minutes travel time, although with existing Station 36, the response travel time is calculated to be less than 6 minutes.

To understand fire department response capabilities, Dudek conducted an analysis of the travel-time response coverage from the closest, existing stations and from the proposed Otay Ranch Village 14 public safety site (fire station). This modeling analysis was conducted using network analyst tools within GIS software, road data files, and Proposed Project development plan data. Response travel speed for this analysis was held constant at 35 mph, consistent with the Insurance Services Office Public Protection Classification Program's Response Time Standard, and incorporated impedances (slowdowns) for intersections and turns by the model. This average speed has been validated for the Insurance Services Office as still being applicable as a predictive tool and considers average terrain, average traffic, weather, and slowing down for intersections. Proctor Valley Village circulation systems include certain traffic-calming tools to improve pedestrian

safety, and a 35 mph response travel speed is considered appropriate because the Villages' street sections comply with fire access travel width requirements. Model output files were used to analyze the quantity and percentage of individual Proposed Project units that could be reached by fire response personnel from each station, assuming travel time and speed constraints.

Once the network data set parameters were finalized, Dudek ran network models to depict the response coverage from the permanent public safety site location. The model results provided in Appendix F depict the geographic limits that can be reached within travel time intervals. The closest existing SDCFA station, Station 36 in Jamul at the intersection of Peaceful Valley Road and Campo Road, is capable of reaching roughly 4% of the Proposed Project's lots (but nearly 95% of Planning Areas 16/19) within the 5-minute travel time and all of Planning Areas 16/19 within 6 minutes. Responses vary from 3 minutes in the northerly Project Area up to roughly 10 minutes travel for the most southerly neighborhoods. These travel times are better than the existing Chula Vista Fire Stations (Nos. 6 and 8) with Station No. 6 not capable of responding to any of the Proposed Project within 5 minutes and requiring as long as 15 minutes for portions of Planning Area 16. Station 8 may reach the southern portions of Village 14 in just more than 5 minutes of travel, but requires up to 14 minutes for the northern portion of Planning Area 16. Table 6 presents tabular results of the emergency response analysis.

Table 6
Emergency Travel Times from Proposed
Public Safety Site and San Diego County Fire Authority and Chula Vista Closest Stations

5-Minute Travel Time	Quantity of Units Reached within 5 Minutes	Percentage of Residential Units Reached within 5 Minutes	Quantity of Units Reached within 10 Minutes	Percentage of Residential Units Reached within 10 Minutes
Public Safety Site	1,075*	96%	44	4%
CVFD Station 6	0	0%	994*	89%
CVFD Station 8	0	0%	1,002*	90%
SDCFA Station 36	45	4%	987*	88%

CVFD = Chula Vista Fire Department
The travel time analysis considered proposed traffic-calming measures for the Proposed Project. The types of traffic calming proposed maintain the emergency travel speeds modeled for this analysis.
* Includes multifamily residential (116 units) and school (97 units).

As indicated in Table 6 and Appendix F, all of the proposed development lots within Village 14 can be reached within the most restrictive 5-minute travel time standard. The proposed fire station can reach approximately 96% of the Proposed Project's developable lots within 5 minutes of travel, and Station 36 can reach approximately 1% of lots within 5 minutes of travel. The remaining 3% of lots can be responded to within 6 minutes, well within the General Plan's 10-

minute travel time for semi-rural residential. Additional response, as needed, can potentially be provided by the other modeled existing fire stations. Based on this information, the Proposed Project meets the County's travel time standard, and the SDCFA can provide significant resources to emergency calls within the Proposed Project.

Response Capability Impact Assessment and Mitigation

The Proposed Project includes a significant number of new homes, a school site, and commercial structures. Service level requirements could, in the absence of fire facilities and resources improvements, cause a decline in the SDCFA response times and capabilities. The requirements described in this FPP are intended to aid fire-fighting personnel and minimize the demand placed on the existing emergency service system. However, additional firefighting capabilities and resources would be required to meet the demands created by the Proposed Project.

To avoid potential degradation of services, meet the anticipated increased demand in accordance with County emergency travel times in compliance with SDCFA requirements, and respond to the risks, the Proposed Project would be required to provide additional firefighting and emergency medical response capabilities. General additional resources required to serve the Proposed Project are outlined in Section 5.4 of this FPP.

5.4 Proposed Project Fire and Emergency Services

The following summary provides information pertaining to fire and emergency service response configuration for the Proposed Project. Final fire and emergency services may include implementation of an optional configuration, discussed below.

Proposed Project Fire and Emergency Response Configuration

As discussed, the Village 14 portion of the Project Area is subject to the 5-minute travel time standard. To ensure that all lots within Village 14's Development Footprint could be served within a 5-minute travel time, the public safety site would be centrally located within the Village Core. Not only does this provide for better response coverage, but the location adjacent to the neighborhood Village Green park, and across from the mixed-use and elementary school site ensure the public safety site would also be a civic presence and located near the highest anticipated potential call-generating land uses. Timing of construction of a temporary station (if the permanent station is not constructed at the commencement of construction) and a permanent fire station within the Proposed Project would be finalized and documented in a Fire Services Agreement between the Proposed Project applicant and the SDCFA. The temporary fire station, if necessary, would be available and located with SDCFA guidance so that it is available during vertical construction and for a specified period. Construction of the permanent fire station would

be on the public safety site identified in the Otay Ranch Village 14 and Planning Areas 16/19 Specific Plan and Tentative Map at an agreed upon trigger threshold, that would be detailed in the Fire Services Agreement.

The Proposed Project would provide fair share funding toward staffing and equipping the station of a size that would be needed to serve the Proposed Project's generated calls. The type and size of the permanent fire station would be based on the projected call volume and the anticipated apparatus and staffing. The fire station would include a Proposed Project-provided advanced life support Schedule A engine company. The station would be equipped with a fire engine, potentially a Type II interface fire engine that is suited to respond to structure fires or vegetation fires. Staffing is expected to include an interim period where two career firefighter positions and one reserve position are provided until a unit count or similar threshold is reached, at which time, staffing would include three career positions and a reserve. Depending on the number of emergency medical calls generated by the Proposed Project, the ambulance provider may elect to move a unit to the Proposed Project, but that would be an independent decision for the ambulance provider. A Fire Service Agreement would be drafted and ready to execute by the Proposed Project applicant and the SDCFA prior to the Proposed Project's Board of Supervisor's hearing.

In addition to the fire station provided by the Proposed Project, SDCFA has a Type I engine and a ladder truck company located at the existing Jamul Fire Station (Fire Station 36) (roughly 3 to 6 miles from the nearest and furthest portions of the Proposed Project). This is a four-person, advanced life support truck company that would be available to respond to the Project Area, as needed.

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

6.1 Fuel Modification Zones

6.1.1 Zones and Permitted Vegetation

As indicated in preceding sections of this FPP, an important component of a fire protection system is the FMZ. FMZs are designed to gradually reduce fire intensity and flame length and, therefore, reduce the fire from advancing by strategically placing thinning zones, restricted vegetation zones, and irrigated zones adjacent to each other on the perimeter of the community's WUI exposed structures, as well as around all structures, including the following:

- All residential and commercial occupancies
- School
- Public safety center/site
- Mixed-use sites
- Open space areas within the Development Footprint
- Emergency access roads or streets

Based on the modeled extreme weather flame lengths for the Proposed Project, average wildfire flame lengths are projected to be approximately 34 feet high in limited areas of Development Footprint-adjacent fuels. The fire behavior modeling system used to predict these flame lengths was not intended to determine sufficient FMZ widths, but it does provide the average predicted length of the flames, which is a key element for determining "defensible space" distances for providing firefighters with room to work and minimizing structure ignition. For this Proposed Project, the FMZ width outside the lot line is 100 feet, ranging from 2.5 to 10 times the modeled flame lengths based on the fuel type represented adjacent to the Development Footprint. There are five exception areas to the 100-foot-wide FMZ areas, as discussed in detail in Section 6.1.1.1.

The following FMZ requirements would be implemented for the Proposed Project. In addition to the FMZs meeting defensible space requirements, the entire developed landscape would be restricted to lower flammability landscaping as part of a fire adapted community approach. Limited building zones (LBZs) and/or LDAs would be established for each lot in Planning Areas 16/19 that borders the Otay Ranch RMP/MSCP Preserve. The LBZs and LDAs limit where buildings may be constructed on these larger lots by excluding their positioning within 100 feet of open space areas, with two exceptions where the LBZ is reduced to a minimum of 70 feet wide (Lots 15 and 16 in Planning Area 16). The FMZs, LBZs, LDAs, and landscape areas are

presented graphically in Appendix G. The zones depicted for Planning Areas 16/19 in Appendix G are interim zones that would be customized due to the larger lots and unknown location of the structures. The larger lots in Planning Areas 16/19 would include 100-foot FMZs from the structure outward in all directions. In addition, the proposed fire adapted plant palette is provided in Appendix H.

Fuel Modification Zone Definition

FMZs are designed to provide buffers at perimeter areas of development projects to reduce fuel available to wildfire. These zones reduce fire spread rates and fire intensity by providing thinned fuels in the outer zones and irrigated, selective plantings in the inner zones. FMZs are typically 100 feet wide and are positioned around the perimeter of higher-density projects because the developed areas include lower flammability, maintained landscapes. In less dense development, like Planning Areas 16/19, FMZs start at the structures and extend outward. In addition, where a property is adjacent to Otay Ranch RMP/MSCP Preserve areas, an LBZ and/or LDA is provided that maintains a 100-foot-wide no-construction buffer (note exceptions for Lots 15 and 16 in Planning Area 16, which are provided a minimum of 70-foot-wide FMZs and alternative measures for structure protection). The LBZ can be used as an FMZ if an accessory structure is constructed adjacent to the LBZ. The LDA limits uses similarly to an LBZ but also excludes the use of irrigation.

Fuel Modification Zones in Village 14

The total width of the FMZs for Village 14 phases would be 120 feet, with the rear yards, which average 20 feet, included as part of the FMZ measurement. Therefore, a typical landscape/fuel modification installation for the Proposed Project's perimeter lots exceeds the 100-foot standard, consisting of up to a 120-foot-wide fuel management area from the structure extending outwards toward preserved areas.

Some development edge conditions would include an FMZ that is more than 100 feet in width and may include varying sizes of Zone 1 and Zone 2, such as adjacent parks and basins, which allow more FMZ flexibility due to the lack of residential structures. Refer to the Proposed Project's Specific Plan for examples of these conditions.

The provided fire station lot and adjacent park may require the placement of a heat-deflecting landscape wall on the northern boundary to mitigate a reduced FMZ. Depending on the placement of the buildings on the lot, a full FMZ may be possible. If not, then the 6-foot masonry (or other non-combustible) wall would be constructed under the approval of the SDCFA.

Fuel Modification Zones in Planning Areas 16/19

The layout of the building structures on the large estate and ranchette lots in Planning Areas 16/19 cannot be determined at this time. As depicted in Figure 6, Typical Lots Greater Than 2 Acres – FMZ Scenarios, Planning Areas 16/19 would include both 100-foot-wide FMZs between individual buildings within each lot and areas designated as LBZs or Limited Building Areas adjacent to the Otay Ranch RMP/MSCP Preserve and open space areas. Figure 6 depicts various scenarios that may exist once building structures are sited on the lots at time of building permit. Therefore, the FMZ depicted in Figure 6 is an interim condition until the building structures are sited on the lots at building permit. The interim FMZ may be modified by SDCFA at building permit issuance. The following requirements would be implemented:

1. Primary residences would include 100 feet of FMZ in all directions to the property lines. Unless alternative materials or methods are approved by SDCFA, it is anticipated that neighboring properties would include overlapping FMZ areas, so the outer portion of a lot's FMZ may be provided by a reciprocal FMZ on a neighboring property, similar to a typical tract. The Covenants, Conditions, and Regulations (CC&Rs) would provide for reciprocal/overlapping FMZ easements and maintenance enforcement.
2. Small accessory structures consistent with the fire code, accessory structures that are less than 250 square feet and 30 feet or more from the primary residence are not considered structures with regard to providing additional fuel modification. They would be allowed within the 100-foot FMZ provided for the primary residence if they meet all other applicable requirements. If 250 square feet or larger, or within 30 feet of the primary residence, then the FMZ would be extended from the structure outward.
3. Large accessory structures that are 250 square feet or larger, regardless of their location, would be required to provide 100 feet of FMZ in all directions, unless alternative materials or methods are approved by SDCFA. The 100-foot-wide FMZ may include Project Area FMZ, or a combination of Project Area FMZ and off-site FMZ associated with neighboring property FMZs (reciprocating/overlapping FMZs). Where these options are not possible, such as when there is no off-site FMZ and a project cannot achieve a 100-foot-wide FMZ within its property boundary, then the property owner may submit to SDCFA for review a focused FPP indicating the building details, a lot development map with available FMZ measurements, and proposed mitigations for the reduced FMZ. Mitigations may include measures or combinations of measures, including an off-site FMZ easement from neighbor(s), building hardening, more restrictive FMZ (lower plant density), non-combustible ground cover, heat-deflecting landscape walls, or other measures.

4. An LBZ would be required on portions of all large lots adjacent to Otay Ranch RMP/MSCP Preserve in Planning Areas 16/19. The LBZs would restrict the construction of accessory structures or other.
5. For buildings within 100 feet of Otay Ranch RMP/MSCP Preserve, LBZs would be recorded easements. Note that Lots 15 and16 in R-14 in Planning Area 16 includes a 70-feet-wide LBZ.
6. Lots 15 and 16 in R-14 in Planning Area 16 include a mitigating condition for a heat-deflecting landscape wall on the eastern sides due to the potential inability to achieve a full 100 feet of FMZ. Depending on the placement of a residence on these lots, a 6-foot tall masonry wall would be placed at the top of slope on the edge of the building pad to augment the achievable FMZ. It is estimated that FMZs would be a minimum of 70 feet wide for these two lots.
7. Structures in R-13 (Planning Area 19) may receive reduced FMZ on the northern side, depending on position of structures on the lots. The reduced FMZs are considered appropriate given the off-site, adjacent properties that are developed and include disturbed and maintained landscapes.

Fuel Modification Zone Discussion

Research has indicated that the closer a fire is to a structure, the higher the level of heat exposure (Cohen 2000). However, studies indicate that given certain assumptions (e.g., 10 meters of low-fuel landscape, no open windows), wildfire does not spread to homes unless the fuel and heat requirements (of the home) are sufficient for ignition and continued combustion (Alexander 1998; Cohen 1995). Construction materials and methods can prevent or minimize ignitions. Similar case studies indicate that with nonflammable roofs and vegetation modification from 10 to 18 meters (roughly 32–60 feet) in Southern California fires, 85%–95% of the homes survived (Foote and Gilless 1996; Howard et al. 1973).

OPEN SPACE LOT

100-FT LIMITED BUILDING ZONE

204' 21' 126' 100' 98' 75' 156' 37' 163'

455' 443' 434' 445'

448'

30'

190' 198'

181' 256' 202'

200' 24' 212'

148' 217'

30'

50'

425' 432' 446' 436'

100'

100-FT FUEL MODIFICATION ZONE

432'

94' 100' 66' 83' 48' 175' 204'

0 30 60 120 Feet

Combined 100-Ft FMZ
100-Ft FMZ
Limited Building Zone (100-Ft Wide)
Open Space Lot
Typical Residence-4500 SF
Cabana/ /Guest House - 800 SF
Barn - 250 SF
Barn - 1500 SF
Large Barn -3000 SF
Road

Document Path: Z:\Projects\j820701\MAPDOC\DOCUMENT\FIRE\Figure 6_Typical FMZ 2Ac+ Lots.mxd

DUDEK

FIGURE 6

Typical Lots Greater Than 2 Acres - FMZ Scenarios

Otay Ranch Village 14 and Planning Areas 16 and 19

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These results support Cohen's (2000) findings that if a community's homes have a sufficiently low home ignitability (i.e., 2017 San Diego County Consolidated Fire Code and 2016 California Building Code), the community can survive exposure to wildfire without major fire destruction. This provides the option of mitigating the wildland fire threat to homes/structures at the residential location without excessive wildland fuel reduction and focusing the effort in the areas nearest the structures. Cohen's (1995) studies suggest, as a rule-of-thumb, larger flame lengths and widths require wider FMZs to reduce structure ignition. For example, valid structure ignition assessment model results indicate that a 20-foot-high flame has minimal radiant heat to ignite a structure (bare wood) beyond 33 feet (horizontal distance). Whereas, a 70-foot-high flame may require approximately 130 feet of clearance to prevent structure ignitions from radiant heat (Cohen and Butler 1996). This study used bare wood, which is more combustible than the ignition-resistant exterior walls for structures built today.

Obstacles, including steep terrain and non-combustible walls, can block or deflect all or part of the radiant heat, thus making narrower FMZ distances possible. Fire behavior modeling conducted for this Proposed Project indicates that fires in the off-site areas would result in roughly 34-foot-tall flame lengths under extreme conditions.

As indicated in this report, the FMZs, which are adjacent to all Proposed Project structures and outside of the Otay Ranch RMP/MSCP Preserve, and additional fire protection measures proposed for this Proposed Project provide a wildfire buffer, and for Village 14, exceed the standard 100-foot-wide, two-zone standard. The zones are based on a variety of analysis criteria, including predicted flame length, fire intensity (Btu), Study Area topography and vegetation, extreme and typical weather, position of structures on pads, position of roadways, adjacent fuels, fire history, current versus proposed land use, neighboring communities relative to the Proposed Project, and type of construction. The fire intensity research conducted by Cohen (1995), Cohen and Butler (1996), Cohen and Saveland (1997), and Tran et al. (1992) supports the fuel modification proposed for this Proposed Project.

General Criteria

- All plant material listed on the Proctor Valley Village FPP prohibited plant list (Appendix I) would be prohibited within any FMZ.
- 50%–70% of the overall FMZs shall be planted with deep-rooting plant material.
- Debris and trimmings produced by thinning and pruning shall be removed, except for larger woody debris that may be chipped and left for weed and erosion control.
- There shall be no hedging of shrubs so that they do not form a means of rapidly transmitting fire from the native growth to the structures.

- Shrubs may be planted in clusters not exceeding a total of 400 square feet.
- A distance of no less than the width of the largest shrub's mature spread shall be provided between each shrub cluster.
- Non-shrub avenues devoid of shrubs shall be included to provide a clear access route from toe of slope to top of slope and shall be a minimum width of 6 feet and spaced a distance of 200 linear feet on center.
- Where shrubs or other plants are planted underneath trees, the mature tree canopy shall be maintained at a height no less than three times the shrub or other plant's mature height to break up any fire laddering[3] effect.

Zone 1A – Setback Zone (Village 14)

Zone 1A – Definition

Zone 1A is the first 20 feet (rear yard) from the structure to the lot line in the Village 14 phase areas. This area would be included in the overall Project Area reduced fuel zones. Homeowners would be responsible for ensuring that rear-yard landscaping is compliant with this FPP. The Proposed Project's HOA would include a landscape committee to review and approve landscape plans and provide ongoing education to homeowners regarding fire adapted landscape maintenance.

Zone 1

Zone 1 – Definition

Zone 1 would include all public and private areas located between the lot line and 50 feet outward. These areas may be located on public slopes, private open-space lots, public streets, and/or private yards, as shown in the landscape fuel figure (Figure 6).

Some perimeter lots receive extended Zone 1 FMZs on manufactured slopes or internal fire-safe common area landscaping. These 100-foot-wide FMZs exceed the code requirement by providing low fuel densities and irrigated fuels for the entire 100 feet versus 50 feet of irrigated and 50 feet of thinned area.

[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.

Zone 1 – Specific Criteria:

- This irrigated high plant moisture zone shall be serviced by a permanent, automatic irrigation system that keeps plants hydrated via efficient drip irrigation.
- No tree limb encroachment would be permitted within 10 feet of a structure or chimney, including outside barbecues or fireplaces.
- A minimum of 10 feet would be required between tree canopies.
- Tree maintenance includes limbing-up (canopy raising) 6 feet or one-third the height of a mature tree.
- Additional trees (excluding prohibited or highly flammable species) may be planted as parkway trees on single loaded streets.
- 75% of all groundcover and sprawling vine masses shall be limited to a maximum height of 18 inches.
- 25% of all groundcover and sprawling vine masses may reach a maximum height of 24 inches.
- Ground covers must be of high-leaf moisture content.
- Shrubs shall be less than 2 feet tall, on 5-foot centers.
- Randomly placed, approved succulent-type plant material may exceed the height requirements, provided that they are spaced in groups of no more than three and a minimum of 5 feet away from described "clear access routes."
- Vegetation/landscape plans shall be in compliance with this FPP.

Zone 2

Zone 2 – Definition

Zone 2 would include all public and private areas located between the outside edge of Zone 1 and 50 feet outward. These areas may be located on public slopes, private open space lots, public streets, and/or private yards, as shown in the landscape fuel modification figure (Figure 6).

Zone 2 – Specific Criteria

- Represents a 50% thinning zone – 50% less fuel than on adjacent unmaintained Otay Ranch RMP/MSCP Preserve areas. Zone 2 areas would include removal of dead/dying vegetation, exotics, and plant species listed on the prohibited plant list. Removal of these components would result in 50% thinning of the existing fuels. As necessary to meet the

50% thinning objective, other plants would be removed to create a mosaic of vegetation with adequate spacing and discontinuity.

- All manufactured slopes within this area would be serviced by a temporary, aboveground automatic irrigation system that would be turned off once the plantings are established but would remain in place.
- Trees may be located within this zone, provided that they are planted in clusters of no more than three. A minimum distance of no less than 20 feet shall be maintained between the tree cluster's mature canopies. The trees would be limbed up to maintain vertical separation from understory shrubs.
- Only those trees on the approved plant list (Appendix H) and/or those approved by the biologist shall be allowed within this zone.
- 75% of all groundcover and sprawling vine masses shall be limited to a maximum height of 36 inches.
- 25% of all groundcover and sprawling vine masses may reach a maximum height of 48 inches.
- Randomly placed, approved succulent-type plant material may exceed the height requirements, provided that they are spaced in groups of no more than three.
- Single specimen native shrubs, exclusive of chamise and sage, may be retained, on 20-foot centers.

6.1.1.1 Potential Exception to 100-Foot FMZ

Village 14 – Public Safety and Park Site

Depending on the final positioning of the fire station (on the designated public safety site) and park to the south of the public safety site, the 100-foot-wide FMZs may be reduced to no less than approximately 70 feet. Should this situation be necessary, the following measures would be implemented to provide equivalent protection as the full 100 feet:

- The entire 70 feet or more will be Zone 1, irrigated zone or a combination of irrigated plants and non-combustible ground cover.
- A heat-deflecting landscape wall would be provided at the property line adjacent these properties where 100 feet of FMZ is not achievable.

Planning Area 16 – Lots 15 and 16

These two lots are constrained by the Proposed Project boundary on their east sides. Depending on final building location, FMZ of more than 70 feet wide may be possible. In no case would the FMZ be less than 70 feet. In addition, a 6-foot-tall, heat-deflecting landscape wall of masonry or masonry/fire-rated glass would be provided at the adjacent state ownership boundary at top of slope. This wall would be positioned at the top of slope as a barrier between the native fuels and the FMZ and is intended to deflect heated air and flames upward and over the structures.

6.2 Other Vegetation Management

6.2.1 Roadside Fuel Modification Zones (Including Driveways)

- High Btu producing, flammable vegetation, including shrubs and trees, shall be cleared and are prohibited (refer to the prohibited plant list in Appendix I).
- Tree and shrub canopies shall be spaced such that interruptions of tree crowns occur and horizontal spacing of 20 feet between mature canopies of trees or tree groups is maintained.
- Grass shall be mowed to 4 inches.
- Single tree specimens, fire resistive shrubs, or cultivated ground cover such as green grass, succulents, or similar plants used as ground covers may be used, provided they do not form a means of readily transmitting fire.
- All roads in the development would have vegetation clearance of flammable vegetation on each side, as follows:
    1. Fire access roads (any road that a responding fire engine would use to access an emergency) – 20 feet from edge of pavement.
    2. New roads/driveways – 20 feet from edge of pavement.
    3. Existing roads/driveways – 10 feet from edge of pavement, including along Proctor Valley Road to the north and south of the Project.
    4. Roads within Planning Areas 16/19 that connect neighborhoods would receive 50 feet of FMZ on either side (Appendix G).
- Trees may be placed within roadside vegetation management zones within the developed portions of the Proposed Project. The following criteria must be followed:
    1. Tree spacing must be 20 feet between mature canopies (30 feet if adjacent to a slope steeper than 41%).
    2. Trees must be limbed up one-third the height of mature tree or 6 feet, whichever is greater.

3. No tree canopies lower than 13 feet, 6 inches over roadways.
4. No tree trunks intruding into roadway width.
5. No trees or other plants on the prohibited plant list (Appendix I) are permitted.
6. No flammable understory is permitted beneath trees.
7. Any vegetation under trees to be fire resistive and kept to 2 feet in height or less, and no more than one-third the height of the lowest limb/branch on the tree.

6.2.2 San Diego Gas & Electric Easement

A San Diego Gas & Electric (SDG&E) easement occurs along the northern edge of Village 14 South. This easement will be maintained by SDG&E in accordance with its vegetation management program and standard policies mandated by the CPUC, including the GO 95 rules (CPUC 2015). Accordingly, hazardous fuel conditions will be addressed by SDG&E in a timely manner. The Proposed Project's provided FMZs adjacent to this area account for the native fuels that occur within this easement.

6.2.3 Trail Vegetation Management

Trails include the Community Pathway and a 5-foot-wide decomposed granite trail in Planning Area 16 that are adjacent to and accessible from public roads within the Project Area. Vegetation management alongside these roads/trails is not permitted within the state-owned and managed open space. Trail maintenance would occur on the trails to remove flashy fuels and maintain the trail in a useable, low fuel condition, but does not include removal of fuels along the sides of trails. The HOA/Community Facilities District would maintain trails in the public road right-of-way. Otay Ranch Preserve Owner/Manager, the State of California, or their designees will maintain trails within the Otay Ranch RMP/MSCP Preserve. Community trails would be accessible by emergency all-terrain vehicles, accessed at numerous locations within the community.

6.2.4 Parks and Open Space

- Landscaping within parks, detention basins, and maintained open space areas would be in compliance with the guidelines in this FPP as FMZs.
- Parks, detention basins, and maintained open space areas include 30 feet of Zone 1 fuel modification on the perimeter, and the remaining 70 feet (or in some cases, the entire park, basin, etc.) include characteristics of maintained Zone 1 standards, although are not technically included in the Proposed Project's FMZ.

- LDAs are privately owned and development is not allowed other than infrastructure such as roads and utilities. LDAs are not part of the Otay Ranch RMP/MSCP Preserve. They are included as part of the private lots in the Tentative Map for Planning Area 16. LDAs can be used for fuel modification thinning zones. Fuel modification around pump stations would be provided and would be 50 feet wide.

6.2.5 Vacant Parcels and Lots

Vegetation management requirements would be implemented at commencement and throughout the construction phase, and require different maintenance specifications than post construction. Vegetation management would be performed pursuant to the fire authority having jurisdiction on all building locations prior to the start of work and prior to any import of combustible construction materials. Adequate fuel breaks of at least 30 feet would be created around all grading and other construction activities in areas where there is flammable vegetation.

In addition to the requirements previously outlined, the Proposed Project would comply with the following important risk-reducing vegetation management guidelines during construction:

- Vegetation management would not be required on vacant lots until construction begins. However, perimeter FMZs must be implemented prior to commencement of construction using combustible materials on individual lots or groups of lots.
- Vacant lots adjacent to active construction areas/lots would be required to implement vegetation management if they are within 30 feet of the active construction area. Perimeter areas of the vacant lot would be maintained as a vegetation management zone extending 30 feet from adjacent construction areas.
- Road construction would include the establishment of 30-foot-wide FMZ areas along both sides of graded roads. The FMZ areas may be established following grading of the road.
- Prior to issuance of a permit for any construction, grading, digging, installation of fences, etc. on a vacant lot, the 30 feet at the perimeter of the lot (Village 14) or the development pad (Planning Areas 16/19) is to be maintained as a vegetation management zone.
- In addition to the establishment of a 30-foot-wide vegetation management zone prior to combustible materials being brought into the Development Area, existing vegetation on the entire lot for Village 14 and on the developed portion of the lot for Planning Areas 16/19 would be removed.
- Dead fuel, ladder fuel (fuel that can spread fire from ground to trees), and downed fuels located on vacant lots and/or within the temporary FMZs would be removed and

trees/shrubs would be properly limbed, pruned, and spaced prior to combustibles being brought into the Development Area.

- New power lines would be underground for fire safety during high wind conditions or during fires on a right-of-way that can expose aboveground power lines. Temporary construction power lines may be allowed in areas that have been cleared of combustible vegetation.
- A construction FPP would be prepared to minimize the likelihood of ignitions and pre-plan the Proposed Project fire prevention, protection, and response plan.
- Caution must be used not to cause erosion or ground (including slope) instability or water runoff due to vegetation removal, vegetation management, maintenance, landscaping, or irrigation. Fuel reduction work should include removal of aboveground biomass only. No uprooting of treated plants/fuels is necessary.

6.2.6 MSCP Preserve/Otay Ranch Preserve

A Community Facilities District, HOA, Otay Ranch Preserve Owner/Manager, or other legal entity approved by the SDCFA Fire Marshal (Approved Maintenance Entity) will obtain permission from the County, and/or the appropriate resource agencies (California Department of Fish and Wildlife, U.S. Fish and Wildlife Service, U.S. Army Corps of Engineers) prior to conducting vegetation management activities within any portion of the Otay Ranch RMP/MSCP Preserve.

6.2.7 Alternative Methods

The builder or private lot owner may submit a lot-specific risk assessment and detailed focused FPP to the SDCFA Fire Marshal proposing alternative methods of fire protection and providing justification for any variance from the recommended vegetation management zones, or encroachment into the LBZs, if there is a practical difficulty, or environmental constraint, in providing the entire size of the necessary vegetation management zone detailed herein. The focused FPP will need to fully justify any alternative means and methods/mitigation measures proposed for reductions in the FMZs and is subject to Fire Marshal approval.

6.2.8 Private Residential Lots

This FPP provides direction for community managed and maintained FMZs in the Village 14 phase areas and for privately maintained FMZ in Planning Areas 16/19. It also provides a guide for selecting lower-flammability plant material along with planting and maintenance requirements for private lot owners. The 100-foot FMZ would be required to be planted with low flammability plantings consistent with this FPP. In addition, it is recommended that none of the

plant materials listed in Appendix I in this FPP, or otherwise known to be especially flammable, are allowed to be planted on private lots. This FPP, or a summary of its key points, would be provided to all buyers in a private property owner's guide to living in a fire environment. In addition, the Proposed Project CC&Rs would include a reference to the FPP, and the HOA's (or similar entity's) landscape committee would not approve plans that include any of the prohibited plant species to ensure compliance with the FPP.

6.2.9 Annual Fuel Modification Maintenance

Vegetation management would be completed annually by May 1 of each year and more often as needed for fire safety, as determined by the SDCFA. Homeowners and private lot owners would be responsible for all vegetation management on their lots, in compliance with this FPP, which is consistent with SDCFA requirements. The approved maintenance entity would perform FMZ maintenance in all Village 14 community FMZs and would be responsible for and would have the authority to ensure long-term funding, ongoing compliance with all provisions of this FPP, including vegetation planting, fuel modification on the perimeter and within interior maintained common areas, vegetation management, and maintenance requirements on all private lots, multifamily residences, school (SDCFA may inspect schools and enforce fuel modification requirements), parks, common areas, roadsides (including Proctor Valley Road), and open space under their control (if not considered Otay Ranch RMP/MSCP Preserve). Any water quality basins, flood control basins, channels, and waterways would be kept clear of flammable vegetation, subject to Section 6.2.6.

Planning Areas 16/19 FMZs would be maintained by individual property owners with HOA or another approved maintenance entity responsible for enforcing that all properties are maintained and consistent with the FMZ requirements of SDCFA and this FPP. The CC&Rs would provide for reciprocal/overlapping FMZ easements and maintenance enforcement. If an HOA or other funded entity is responsible for FMZ maintenance in Planning Areas 16/19, an inspection easement may be established. When FMZ non-compliances are documented, owners or responsible party would be provided with a violation notice and a timeline on when to mitigate the issue. If not completed within the timeline, then the HOA can remediate and collect payment from the homeowner. Alternatively, there may be instances where an FMZ violation would need to be turned over to SDCFA for additional enforcement and a lien placed on the property.

6.2.9.1 Annual FMZ Compliance Inspection

To confirm that the Proposed Project's common areas and Planning Areas 16/19 private lot FMZs and LBZs are being maintained according to this FPP, the approved maintenance entity would obtain an inspection and report from a SDCFA-authorized Wildland Fire Safety Inspector,

in May of each year, certifying that vegetation management activities throughout the Proposed Project have been performed pursuant to this FPP. LBZs would be recorded easements and part of the inspection program. This report would be funded (the maintenance entity would contract with an approved third-party inspector) by the approved maintenance entity and submitted to SDCFA for approval. Planning Areas 16/19 represent the more complicated FMZ maintenance scenario due to FMZs occurring on private lots vs Village 14, where FMZ primarily occurs on common areas. Homeowners would be provided a copy of this FPP and the FMZ maintenance requirements by the HOA or approved maintenance entity at time of purchase.

6.3 Road Requirements

6.3.1 Access

Access Roads

Project Area access, including road widths and connectivity, would comply with the requirements of the Consolidated County Fire Code (Section 96.1.503) (County of San Diego 2017). Appendix J presents the proposed road and street classifications, along with detailed measurements.

- All fire access and vehicle roadways would be of asphaltic concrete or approved alternative surfacing materials and designed and maintained to support the imposed loads of fire apparatus (not less than 75,000 pounds) that may respond, including Type I, II, and III engines, ladder trucks, and ambulances. Proposed Development Footprint roads would meet San Diego County Department of Public Works' (DPW's) Road Standards. Access roads would be at a minimum provided first layer of pavement prior to combustible construction occurring.
- Note that the existing Proctor Valley Road would be improved for its entirety. Improvements to Proctor Valley Road would be phased in to the satisfaction of the DPW and the SDCFA. Development Footprint roads would be constructed to a minimum unobstructed width of 24 feet and would be improved with aggregate cement or asphalt paving materials. There would be at least two points of primary access from Proctor Valley Road to South Village 14, Central Village 14, and North Village 14 phases, as well as the Planning Areas 16/19 phase for emergency response and evacuation. Interior residential streets would be designed to accommodate a minimum of a 75,000-pound fire truck.
- Fire access roads for each phase would meet Proposed Project-approved fire code requirements and/or mitigated modifications for maximum allowable dead-end distance, paving, and fuel management prior to combustibles being brought to the Development Area.

- Fire lane road at commercial buildings, and schools (road closest to the building) would be 26 feet wide, per code or as approved by County Fire Marshal.
- Street parking would be provided on one or both sides of residential collector streets, depending on the location within the Project Area. Parking would be assumed to be 6 to 8 feet in width. Where road widths do not accommodate parking, restrictions would apply, per the DPW Road Modification, and the streets would be posted with signs stating "No Parking; Fire Lane." Street sections are to be reviewed and approved by the County DPW and the County Fire Marshal.
- Roads with a median or center divider would have at least 12 feet of unobstructed width on both sides of the center median or divider. Emergency fire truck access points would be provided through the center divider at 1,000-foot intervals, where road segment length allows.

Secondary Access

- A minimum of two entrances from each of the Proposed Project phases would be provided. The location of these entrances satisfies the need for secondary access Figure 7a, Circulation Plan, indicates Proposed Project road circulation and secondary access.
- Any dead-end roads longer than 150 feet would have approved provisions for fire apparatus turnaround. Fire apparatus turnarounds would include a turning radius of a minimum 28 feet, measured to the inside edge of improved width (County of San Diego 2017, CCFC 96.1.503.2.4).
- The longest dead-end road (cul-de-sac) allowed by the County Consolidated Fire Code and CCR Title 14 varies by phase and lot size minimums. Maximum dead end road length in Village 14 South, Central, and North is 800 feet. No dead-end cul-de-sac lengths in these areas would exceed 800 feet.
    - Note that in the Southern Procter Valley Village, Streets "A" and "M" include wider roads and do not have driveways, enabling free traffic flow.
- The Planning Area 16 phase includes 2-acre and 3-acre lots, and Planning Area 19 phase consists of 1-acre lots, allowing 1,320 feet for dead-end road length. There are no dead-end road lengths greater than 1,320 feet. Area R-12 includes 4-acre and 5-acre parcels. The County of San Diego Consolidated Fire Code indicates a maximum dead-end road length of 1,320 feet, and the Proposed Project complies (County of San Diego 2017).
    - The Proposed Project complies with secondary access and avoidance of dead-end roads that exceed the allowable 800 or 1,320 feet, respectively.

- Cul-de-sac bulbs are required on dead-end roads in residential areas where roadways serve more than two residences. Cul-de-sacs would be provided with a paved radius of 42 feet to allow for street parking within the cul-de-sac.
- Roadways and/or driveways would provide fire department access to within 150 feet of all portions of the exterior walls of the first floor of each structure.
- Roadway design features (e.g., speed bumps, humps, speed control dips, planters, and fountains) that could interfere with emergency apparatus response speeds and required unobstructed access road widths would not be installed or allowed to remain on roadways (County of San Diego 2017). Traffic-calming features (i.e., raised intersections, intersection neck downs, roundabouts, and parallel bay parking with landscape pop-outs) are proposed and may be allowed, subject to approval by the SDCFA and County DPW.
- Vertical clearance of vegetation along roadways would be maintained at 13 feet, 6 inches. Vertical clearance in the commercial areas to be clear to the sky to allow aerial ladder truck operation.
- Angle of driveway/roadway approach/departure would not exceed 7 degrees (12%) per SDCFA.
- Road grades would not exceed 15%, unless approved by the Fire Chief (maximum 20% with mitigations).
- Developer would provide information illustrating the new roads, in a format acceptable to the SDCFA, to update the SDCFA maps (County Fire Code, Section 96.1.505.5) (County of San Diego 2017).
- Any roads that have traffic lights would have SDCFA-approved traffic preemption devices (Opticom) compatible with devices on the Fire Apparatus, per SDCFA.

6.3.2 Gates

Access gates proposed for the Proposed Project would comply with SDCFA codes, Section 96.1.503.6 (County of San Diego 2017). Planned gate locations are illustrated in Figure 7b, Gates and Emergency Access. Public roads would not be gated. Any gates on private roads or on private driveways may be permitted but must comply with SDCFA standards for electric gates and would not represent a dead-end road condition that jeopardizes the dead end road length requirements for this Proposed Project.

- Access gates are to be equipped with a KNOX key switch, which overrides all command functions and opens the gate. All proposed gates would be equipped with sensors for detecting emergency vehicle “opticom” strobe lights and/or sirens from any direction of

approach. Strobe detection and key switches would be provided on the interior and exterior of gates. Gates would automatically open when any vehicle approaches via vehicle detection loops.

- Switches may be dual keyed for SDCFA and law enforcement access.
- Gate activation devices would be equipped with a battery backup or manual mechanical disconnect in case of power failure.
- Further, gates would be:
  - Wider than the roadway;
  - Inclusive of area lighting;
  - Constructed from non-combustible materials;
  - Inclusive of provisions for manual operation from both sides, if power fails. Gates would have the capability of manual activation from the development side, via contact by a person or a vehicle (including a vehicle detection loop);
  - Located 30 feet from any intersecting road; and
  - Operable by activation with fire truck radio.

6.3.3 Driveways

Any structure that is 150 feet or more from a common road in the Development Footprint would have a paved driveway meeting the following specifications:

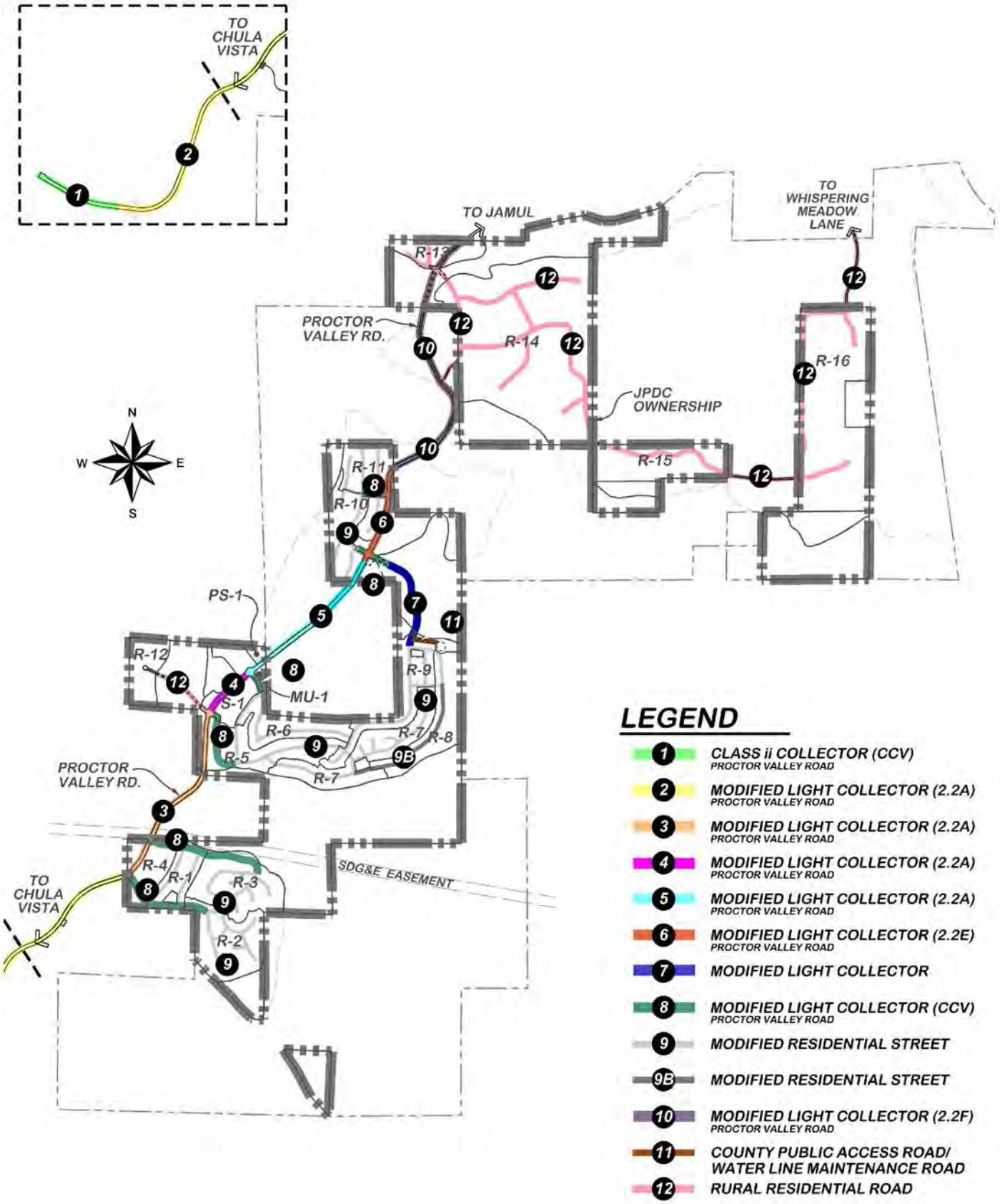
- Grades less than 20% with surfacing and sub-base consistent with the County Parking Design Manual.
- Driveways serving two houses or fewer would be 16 feet wide unobstructed with a fire apparatus turnaround. Driveways serving more than two houses would be 24 feet wide unobstructed.
- Driveways in excess of 150 feet would be provided hammerhead turnarounds to County Code.
- Driveway gates to comply with Section 6.3.2.

Identification of roads and structures would comply with County of San Diego Consolidated Fire Code, Section 96.1.505, as follows (County of San Diego 2017):

- All structures would be identified by street address numbers at the structure. Numbers would be 4 inches in height, 0.5-inch stroke, and located 6 to 8 feet above grade.

Addresses on non-residential buildings would be 6 inches high with 0.5-inch stroke. Address numbers would contrast with background.

- Multiple structures located off common driveways would include posting addresses on structures, on the entrance to individual driveways, and at the entrance to the common driveway for faster emergency response.
- Structures 100 feet or more from a roadway would include numbers at the entrance to the driveway.
- Proposed roads within the Proposed Project development would be named, with the proper signage installed at intersections to the satisfaction of the SDCFA and the DPW (County of San Diego Standard DS-13).
- Streets would have street names posted on non-combustible street signposts. Letters/numbers would be 4 inches high, reflective, on a 6-inch-high backing. Signage would be 7 feet above grade. There would be street signs at the entrances to the development, all intersections, and elsewhere as needed subject to approval of the Fire Chief.
- Access roads to private lots to be completed and paved prior to lumber drop and prior to the occurrence of combustible construction.



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SOURCE: Hunsaker 2016

FIGURE 7a

Circulation Plan

Otay Ranch Village 14 and Planning Areas 16 and 19

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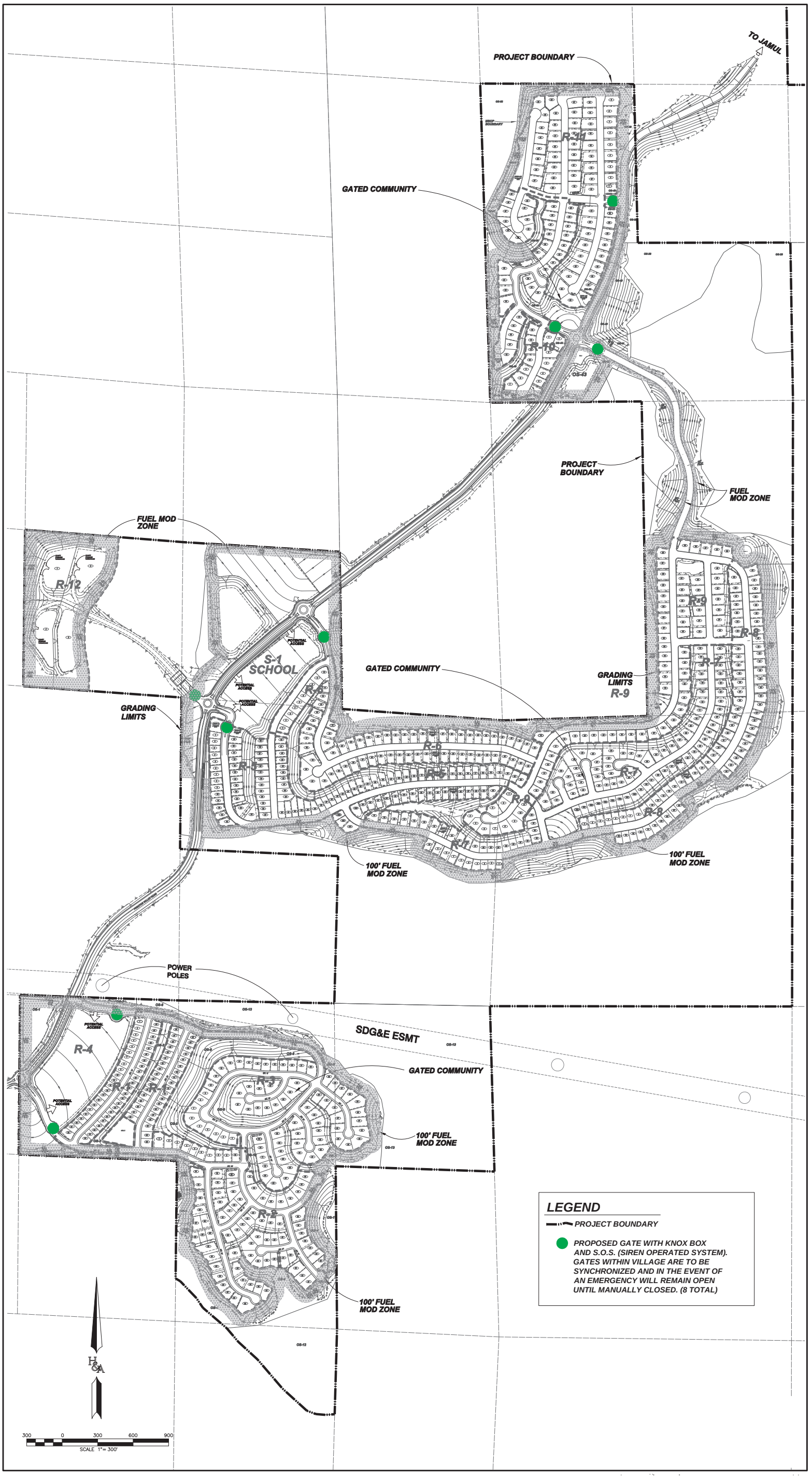

SOURCE: HUNSAKER AND ASSOCIATES 2017

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FIGURE 7b
Gates & Emergency Access

Otay Ranch Village 14 and Planning Areas 16 and 19

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6.4 Structure Requirements

6.4.1 Ignition-Resistance

This section outlines ignition-resistant construction (for all structures) that would meet the requirements of the 2017 Consolidated County Fire Code and the County Building Code (County Code of Regulatory Ordinance; Title 9, Division 2), Chapter 701-A. The following construction practices respond to the requirements of these codes and are consistent with the 2016 California Fire and Building Codes (Chapter 7-A). Code updates are likely to occur before the Proposed Project is fully constructed. As such, building plans must meet the "then-current" County Building Code in effect at the time of building plan submittal. Appendix K provides a summary of the requirements for ignition-resistant construction.

There are two primary concerns for structure ignition: (1) radiant and/or convective heat and (2) burning embers (IBHS 2008; NFPA 2018). Burning embers have been a focus of building code updates for at least the last decade, and new structures in the WUI built to these codes have proven to be very ignition resistant.

Likewise, radiant and convective heat impacts on structures have been minimized through the CBC Chapter 7-A exterior fire ratings for walls, windows, and doors. Additionally, provisions for modified fuel areas separating wildland fuels from structures have reduced the number of fuel-related structure losses. As such, most of the primary components of the layered fire protection system provided the Proposed Project are required by the SDCFA and state codes. However, these requirements are worth listing because they have proven effective for minimizing structural vulnerability to wildfire and, with the inclusion of required interior sprinklers (required in the 2010 Building/Fire Code update), of extinguishing interior fires, should embers succeed in entering a structure. Even though these measures are now required by the latest Building and Fire Codes, at one time, they were used as mitigation measures for buildings in WUI areas, because they were known to reduce structure vulnerability to wildfire. These measures performed so well, they were adopted into local and state codes.

For instance, San Diego County after-fire assessments, indicate strongly that the building codes are working in preventing home loss; of 15,000 structures within the 2003 fire perimeter, 17% (1,050) were damaged or destroyed. However, of the 400 structures built to the 2001 codes (the most recent at the time), only 4% (16) were damaged or destroyed. Further, of the 8,300 homes that were within the 2007 fire perimeter, 17% were damaged or destroyed. A much smaller percentage (3%) of the 789 homes that were built to 2001 codes were impacted, and an even smaller percentage (2%) of the 1,218 structures built to the 2004 codes were impacted (IBHS 2008). It has been reasoned that by fire officials conducting after-fire assessments that damage to

the structures built to the latest codes is likely from unmaintained flammable landscape plantings or objects next to structures or open windows or doors (Hunter 2008). The building codes developed for construction in high and very high fire hazard zones is working to minimize the vulnerability of new residences and other structures to wildfires. There are numerous examples of master planned communities built to ignition-resistant standards and include HOA-managed FMZs that have been tested by wildfire and functioned as they were intended. The Proposed Project incorporates a fire protection system that has been found by after-action fire reports, independent researchers, and U.S. Geological Survey researchers (2013) to perform well against wildfires. Newer communities, especially those within jurisdictions that have adopted the latest state Fire and Building Codes (like San Diego County), and that have a well-defined FMZ requirement, perform well against wildfires. Examples include Cielo in Rancho Santa Fe, 4S Ranch in San Diego County, Stevenson's Ranch in Santa Clarita, Serrano Heights in Orange County and many others in Southern California.

The following features are required for new development in WUI areas and form the basis of the system of protection necessary to minimize structural ignitions and to provide adequate access for emergency responders. Although these standards would provide a high level of protection to structures in this development and should reduce the potential for ordering evacuations in a wildfire, there is no guarantee that compliance with these standards would prevent damage or destruction of structures by fire in all cases.

1. Exterior walls of all structures and garages are to be constructed with approved non-combustible (stucco, masonry, or approved cement fiber board) or ignition-resistant material from grade to underside of roof system. Wood shingle and shake wall covering is prohibited. Any unenclosed under-floor areas will have the same protection as exterior walls. Per County Building Code, Chapter 7-A: Exterior wall coverings to extend from top of foundation to the underside of roof sheathing, and terminate at 2-inch nominal solid wood blocking between rafters at all roof overhangs, or in the case of enclosed eaves, terminate at the enclosure). The underside of any cantilevered or overhanging appendages and floor projections will maintain the ignition-resistant integrity of exterior walls, or projection will be enclosed to grade.
2. Eaves and soffits will meet the requirements of SFM 12-7A-3 or be protected by ignition-resistant materials or non-combustible construction on the exposed underside, per County Building Code, Chapter 7-A.
3. There will be no use of paper-faced insulation or combustible installation in attics or other ventilated areas per County Building Code.

4. There will be no use of plastic, vinyl (with the exception of vinyl windows with metal reinforcement and welded corners), or light woods on the exterior.
5. All roofs will be a Class "A" listed and fire-rated roof assembly, installed per manufacturer's instructions, to approval of the SDCFA. Roofs will be made tight with no gaps or openings on ends or in valleys, or elsewhere between roof covering and decking, to prevent intrusion of flame and embers. Any openings on ends of roof tiles will be enclosed to prevent intrusion of burning debris. When provided, roof valley flashings will not be less than 0.019-inch (No. 26 gage galvanized sheet) corrosion-resistant metal installed over a minimum 36-inch-wide underlayment consisting of one layer of 72 pound ASTM 3909 cap sheet running the full length of the valley (County Building Code, Chapter 7-A).
6. No vents in soffits, cornices, rakes, eaves, eave overhangs, or between rafters at eaves or in other overhang areas. Gable end and dormer vents to be at least 10 feet from property line or provided alternative design resistant to ember penetration. Vents in allowed locations to be protected with wire mesh having no openings greater than 0.125 inches. Vent openings will not exceed 144 square inches. Vents will be designed to resist the intrusion of any burning embers or debris (County Building Code, Chapter 7-A).
7. Vents will not be placed on roofs unless they are approved for Class "A" roof assemblies (and contain an approved baffle system (such as Brandguard vents) to stop intrusion of burning material) or are otherwise approved.
8. Turbine vents are prohibited.
9. Exterior glazing in windows (and sliding glass doors, garage doors, or decorative or leaded glass in doors) to be dual pane with one tempered pane, or glass block or have a 20-minute fire rating. Glazing to comply with CBC Chapter 7-A.
10. Any vinyl frames to have welded corners and metal reinforcement in the interlock area to maintain integrity of the frame certified to ANSI/AAMA/NWWDA 101/I.S 2 97 requirements.
11. Skylights to be tempered glass (County Building Code, Chapter 7-A).
12. Rain gutters and downspouts to be non-combustible. They will be designed to prevent the accumulation of leaf litter or debris, which can ignite roof edges (County Building Code, Chapter 7-A).
13. Doors to conform to SFM standard 12-7A-1, or will be of approved noncombustible construction or will be solid core wood having stiles and rails not less than 1.625 inches thick or have a 20-minute fire rating. Doors to comply with County Building Code,

Chapter 7-A. Garage doors to be solid core 1.75-inch-thick wood or metal, to comply with code.

14. Decks and their surfaces, stair treads, landings, risers, porches, balconies to comply with language in County Building Code, Chapter 7-A, and be ignition-resistant construction, heavy timber, exterior approved fire-retardant wood, or approved non-combustible materials.
15. Decks or overhangs projecting over vegetated slopes are not permitted. Decks to be designed to resist failing due to the weight of a firefighter during fire conditions. There will be no plastic or vinyl decking or railings. The ends of decks to be enclosed with the same type of material as the remainder of the deck.
16. There will be no combustible awnings, canopies, or similar combustible overhangs.
17. No wood fences to be allowed within 5 feet of structures on any lots. The first 5 feet from a structure will be non-combustible or meet the same fire resistive standards as walls. The exception is that a wood gate may be used adjacent to a structure, if there is a 5-foot length of non-combustible or fire-resistive fencing between the gate and the remainder of the fence where it abuts the structure.
18. All chimneys and other vents on heating appliances using solid or liquid fuel, including outdoor fireplaces and permanent barbeques and grills, to have spark arrestors that comply with the County Fire Code. The code requires that openings be maximum 0.5 inches. Arrestors will be visible from the ground
19. Any liquid propane gas (LPG) tanks (except small barbecue and outdoor heater tanks), firewood, hay storage, storage sheds, barns, and other combustibles will be located at least 30 feet from structures, and, within the FMZ, 30 feet from flammable vegetation. There will be no flammable vegetation under or within 30 feet of LPG tanks, or tanks will be enclosed in an approved ignition-resistant enclosure with 10 feet clearance of flammable vegetation around it. In no case will a tank be closer than 10 feet from the structure (consultant recommendation). County Fire Code requires 10 feet of clearance of native vegetation, weeds, and brush from under and around LPG tanks.
20. Storage sheds, barns, and outbuildings to be constructed of approved non-combustible materials, including non-combustible Class A roofs and will be subject to the same restrictions as the main structure on lot.
21. Additionally, any of the above-listed structures (i.e., outbuildings, storage sheds, barns, and separate unattached garages) that are greater than 500 square feet in size will be equipped with automatic fire sprinklers. Locations, and required FMZs, will be subject to approval of County Fire Marshal and the Building Official based on size of the structure.

6.4.2 Enhanced Defensible Space

The Proposed Project would provide enhanced defensible space by strategically locating non-combustible walls for up to 38 perimeter lots abutting open space that also include a condition where structures are located at the top of a slope. Top of slope setbacks of 30 feet are desirable for two-story homes. These lots provide 20 feet of setback, and the walls are provided to mitigate the reduced setback by providing a barrier in the line of fire at the top of slope. The purpose of these walls is to enhance the protection provided by the FMZs and to provide a measure consistent with meeting the intent of top of slope structure setbacks. Lots 15 and 16 in Planning Area 16 and a section of the property line north of the fire station and public parks in Village 14 are provided walls as part of a system of protection enhancements to compensate for potentially reduced/modified FMZ areas.

Dudek determined that providing strategically located walls within the Development Footprint would result in additional protection by deflecting heat and flames away from structures, as indicated in Appendix L.

The Proposed Project's exterior lots adjacent to slopes provide opportunities to place a non-combustible, 6-foot-tall, heat-deflecting wall to provide additional deflection for these lots. When buildings are set back from slopes, and a wall is placed at the top of slope, flames spreading up those slopes are deflected vertically and over the structure where cooling occurs, reducing the effects of convective heat on the structure (see Figures 8 through 10 for wall and fencing cross-section diagrams). If a structure cannot be setback adequately, or where the slope is less than 30%, a noncombustible wall can help deflect the flames from the structure (NFPA 2013). The duration of radiant heat impact on the downhill facing side of the house is also reduced. An imaginary line extended along the slope depicts the path of the heat (hot air rises) and flame. The structure set back is important to avoid heat and/or flame intersection with the structure.

Heat-deflecting landscape view walls of masonry construction with fire-rated glazing that are 6 feet in height (roughly lower 2 feet masonry construction and upper 3 feet dual pane, one pane tempered glazing or equivalent) would be incorporated at top of slope/edge of lots adjacent to down-slopes as an enhancement to FMZs and defensible space (examples illustrated in Figures 8 through 10). The landscape walls would provide a vertical, non-combustible surface in the line of heat, fumes, and flame 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 fuels burn peaks out within a short (30 seconds to 2 minutes) time frame (Quarles and Beall 2002). If glass is used for view purposes, final determination as to actual type of listed glazing assembly would be to County Fire Marshal and Building Official approval.

Heat-deflecting landscape walls have proven to deflect heat and airborne embers during numerous wildfires in San Diego, Orange, Los Angeles, Ventura, and Santa Barbara Counties. Rancho Santa Fe Fire Protection District, Laguna Beach Fire Protection District, Orange County Fire Authority, and other entities include these walls as alternative methods based on observed performance during wildfires. This has led to these agencies approving use of non-combustible landscape walls as mitigation for reduced FMZs and reduced setbacks at top of slope. These walls are consistent with National Fire Protection Association (NFPA) 1144 Standard for Reducing Structure Ignition Hazards from Wildland Fire – 2013 Edition, Section 5.1.3.3 (NFPA 2013) and A.5.1.3.3, and International Urban Wildland Interface Code. NFPA 1144, A.5.1.3.3 states: "Noncombustible walls and barriers are effective for deflecting radiant heat and windblown embers from structures" (NFPA 2013). These walls and barriers are usually constructed of noncombustible materials (concrete block, bricks, stone, stucco) or earth with emergency access openings built around a development where 30 feet (9 meters) of defensible space is not available.

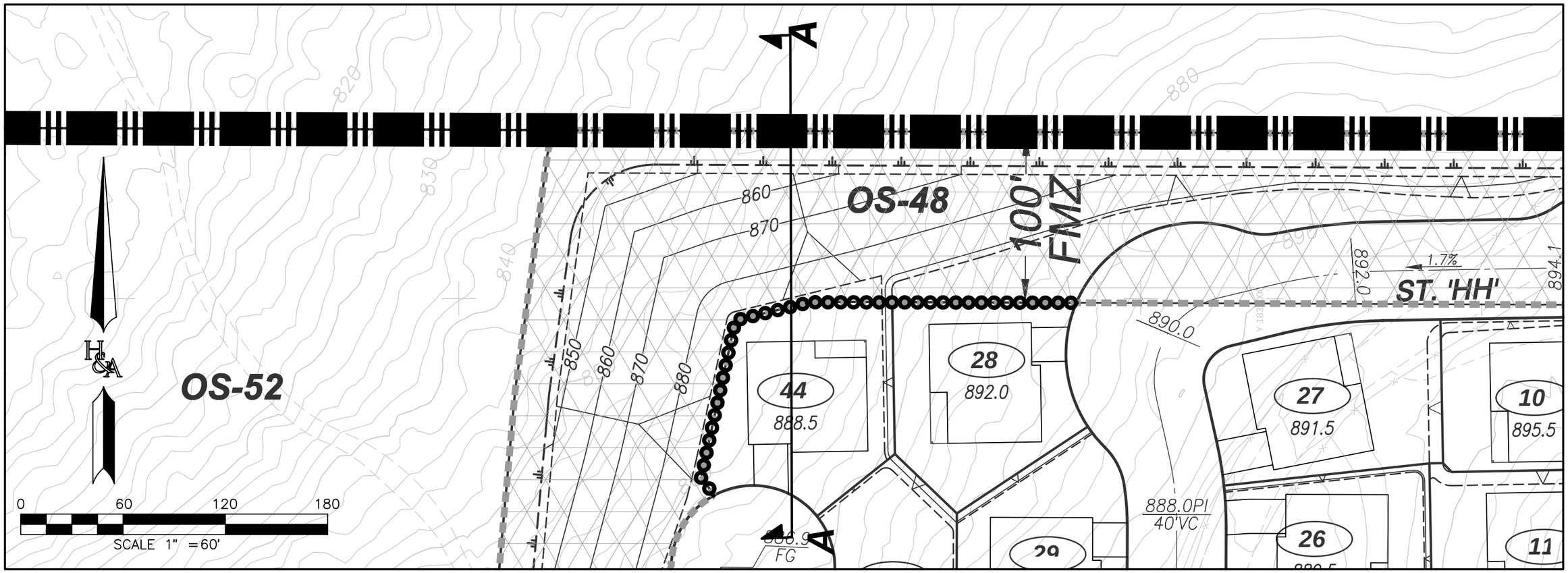
6.4.3 Fire Protection System Requirements

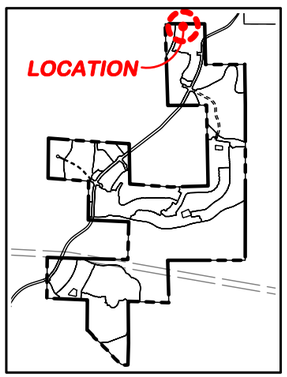
Infrastructure, Structural Fire Protection, and Fire Protection Systems

WUI fire protection requires a systems approach, which includes the components of vegetation management, structural safeguards (both previously addressed), and adequate infrastructure. This section provides recommendations for infrastructure components.

Infrastructure Recommendations

The following conceptual recommendations are made to comply with the SDCFA requirements, the California Fire Code, the County Consolidated Fire Code, and nationally accepted fire protection standards, as well as additional requirements to assist in providing fire protection.





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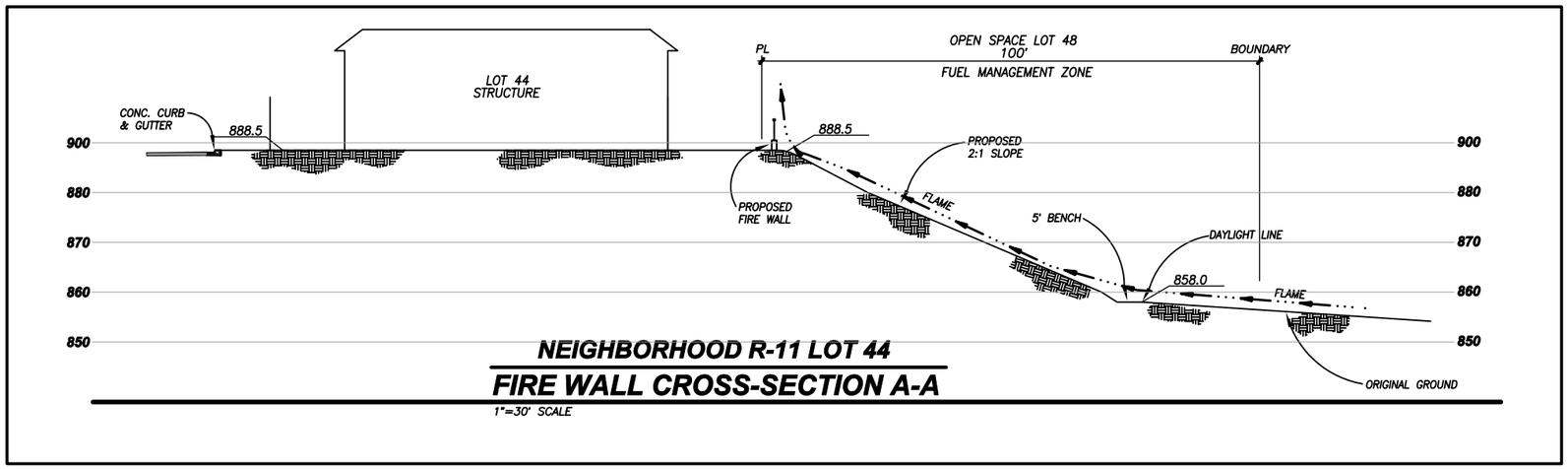

SOURCE: HUNSAKER AND ASSOCIATES 2017

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FIGURE 8

Wall and Fencing Cross-Section Exhibit Section A-A

Otay Ranch Village 14 and Planning Areas 16 and 19

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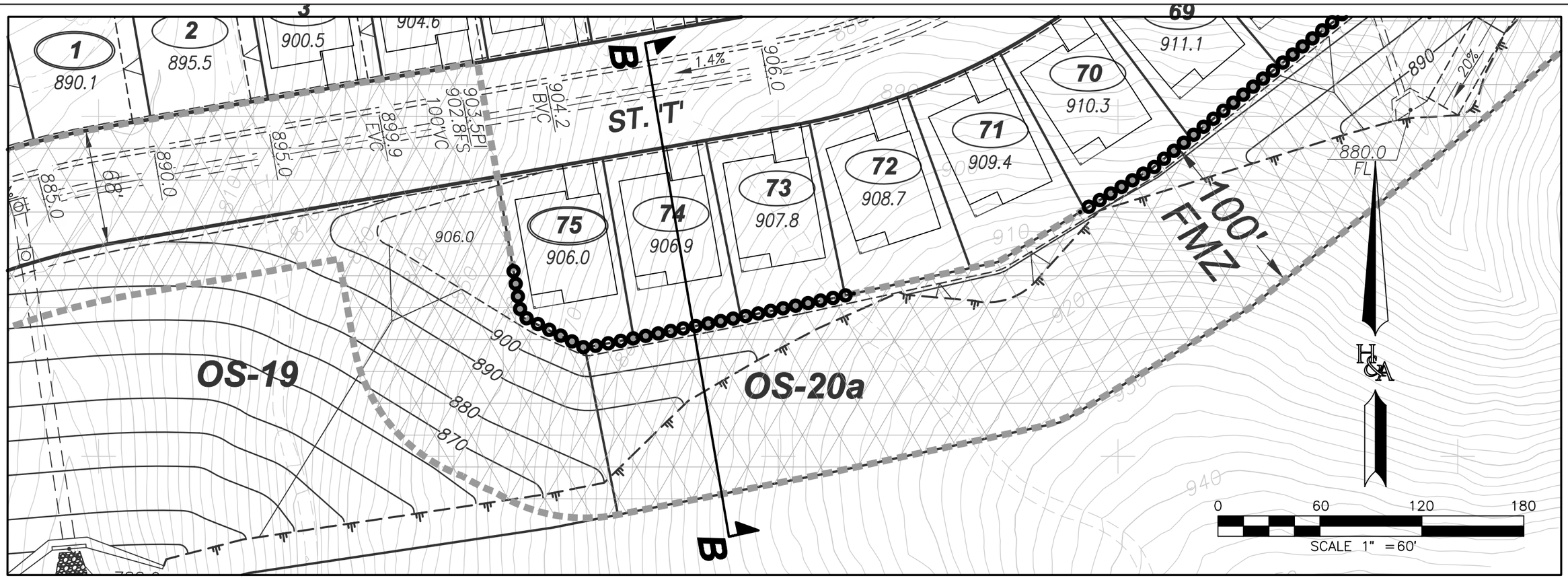

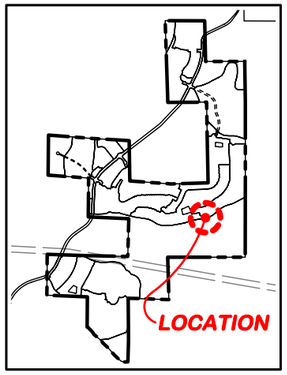

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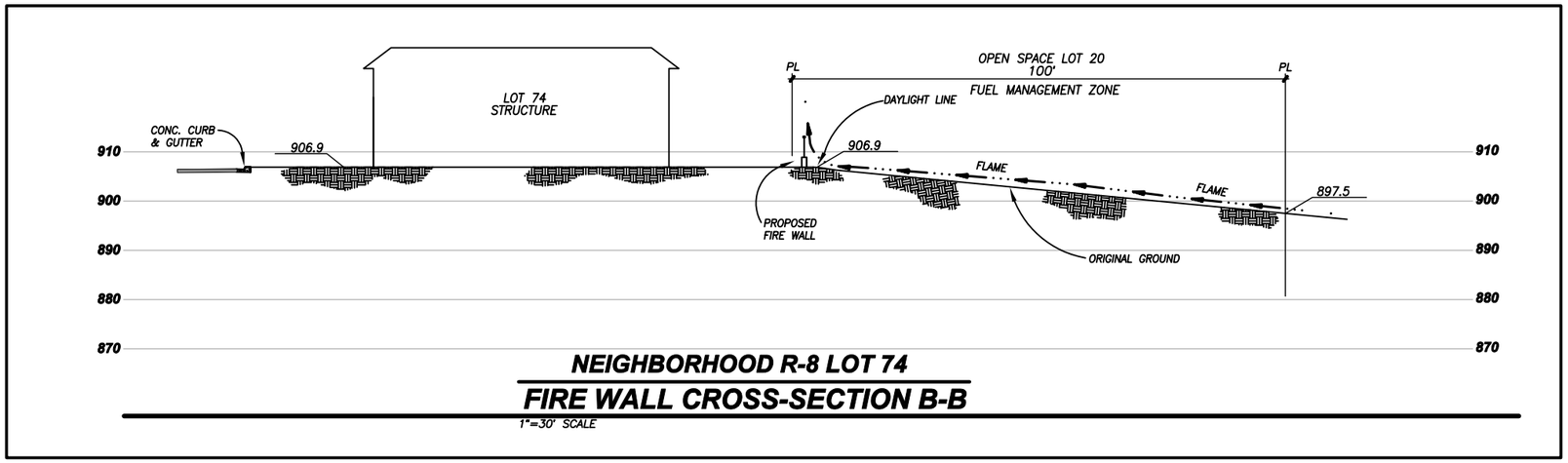

NEIGHBORHOOD R-8 LOT 74

FIRE WALL CROSS-SECTION B-B

1"=30' SCALE

SOURCE: HUNSAKER AND ASSOCIATES 2017

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FIGURE 9

Wall and Fencing Cross-Section Exhibit Section B-B

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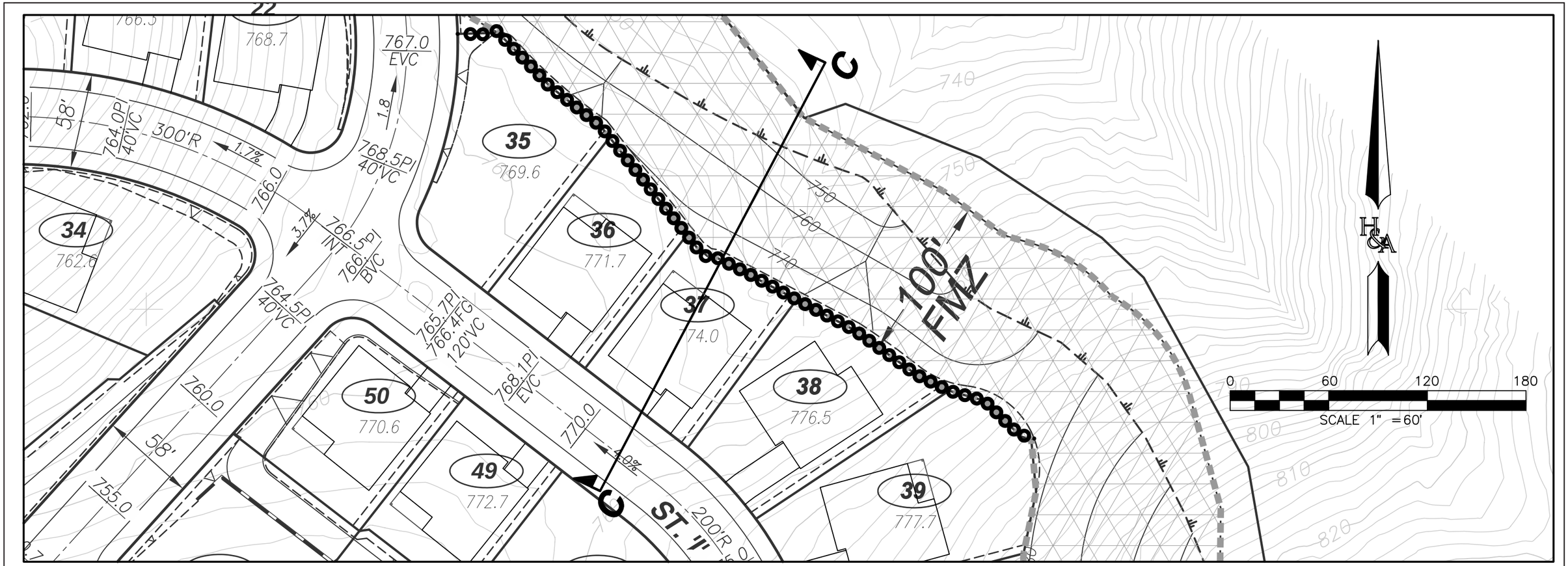

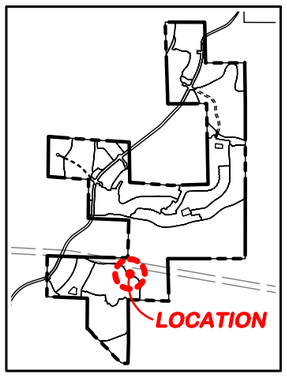

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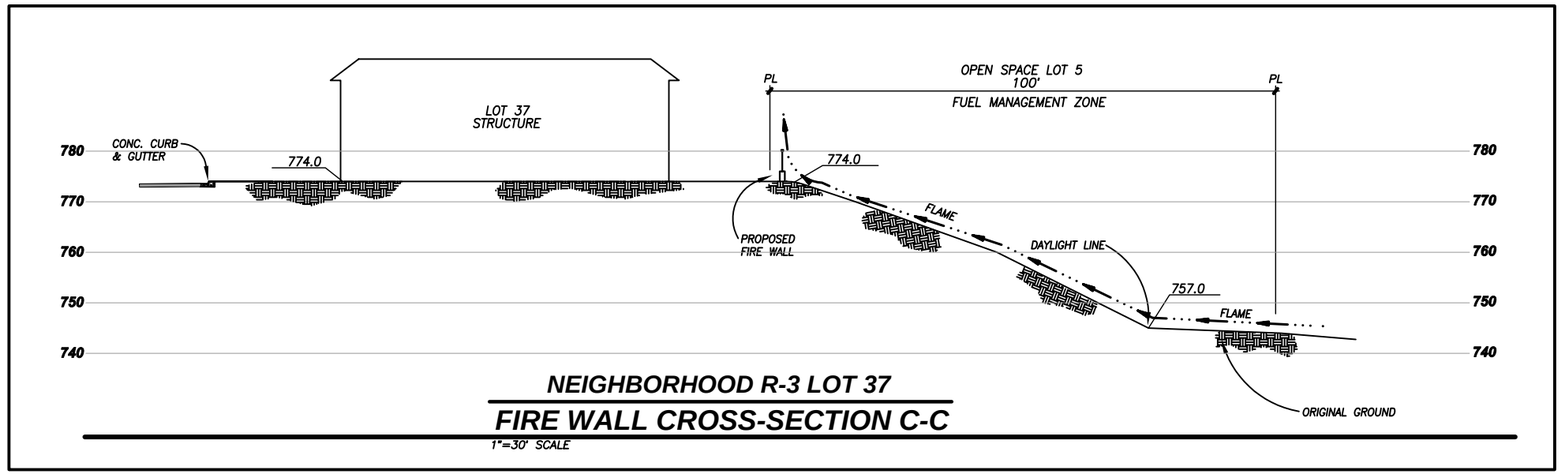

SOURCE: HUNSAKER AND ASSOCIATES 2017

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FIGURE 10

Wall and Fencing Cross-Section Exhibit Section C-C

Otay Ranch Village 14 and Planning Areas 16 and 19

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Water service would be provided by the Otay Water District. All water storage and hydrant locations, mains, and water pressures would be designed to fully comply with San Diego County Fire Code Fire Flow Requirement. Water supply must meet a 2-hour fire flow requirement of 2500 gpm with 20-pounds per square inch (psi) residual pressure, which must be over and above the daily maximum water requirements for this development, as confirmed in the Proposed Project's Water Technical Study (Dexter Wilson 2016).

Fire Hydrants

- Hydrants are subject to SDCFA approval. Hydrants would be located on the normal fire apparatus response side of the road at each intersection and at 350-foot spacing as required by the SDCFA. Where applicable, hydrants would be located at the entrance to cul-de-sac bulb (not in the bulb itself). Hydrants would be provided on each side of any divided road or highway.
- The water system for fire protection would be an approved water supply with hydrants and mains. Fire flow in the mains for residential occupancies would be at least 2,500 gpm in fire mains with a 20-psi residual at periods of maximum peak domestic demand. Fire flow for the multifamily, resort, and commercial occupancies would be a minimum of 2,500 gpm in fire mains and to County Consolidated Fire Code. No credit for sprinklers is available in wildfire prone areas. Duration of flow is 2 hours or more if required by the County Consolidated Fire Code based on the required flow. The amount of stored water for fire protection would be for the required duration (minimum 2 hours) at the worst-case fire flow at times of maximum peak domestic and commercial demand (including agriculture). Any private water systems would comply with NFPA 22 and 24. In addition, fire protection water systems would comply with American Water Works Association Standard M-31; "Distribution Requirements for Fire Protection."
- Hydrants would have one 2.5-inch outlet and one 4-inch outlet and be of bronze construction per the District Fire Code. Hydrants at commercial buildings and schools would have two 4-inch outlets and one 2.5-inch outlet. Fire protection engineer to make determination whether dry barrels are necessary due to freeze potential.
- Hydrants would have a 3- by 3-foot concrete pad at base (gravel if dry barrel hydrant) for weed control.
- Reflective blue dot hydrant markers (minimum 3-inch square) would be installed in the street to indicate location of the hydrant. The lateral shut-off valve would be located in the street 10–25 feet in front of hydrant.

- Crash posts would be provided where vehicles could strike fire hydrants, fire department connections, etc.
- Fire hydrants would be provided every 1,000 feet along Proctor Valley Road and connector roads not adjacent to development.

Fire Sprinklers

All structures, of any occupancy type, are required by the SDCFA to have internal fire sprinklers. (Exception may be granted by SDCFA for detached accessory structures under 500 square feet). One- and two-family residences may have NFPA 13-D systems. Residential structures 7,000 square feet and larger may be required to have a four-head calculation. Enclosed patios and porches, workshops, barns, storage structures, separate unattached garages, RV structures, and auxiliary-use rooms more than 500 square feet are also required to have sprinkler protection. All other occupancies in this development would have fire sprinklers in compliance with SDCFA requirements and the applicable NFPA 13 standard. All systems other than single-family detached dwelling systems to be remotely supervised to an approved 24/7 alarm company.

Fire Alarm Systems

- All residential units would have electric-powered, hard-wired smoke detectors in compliance with Consolidated Fire Code.

6.4.4 Additional Requirements and Recommendations Based on Occupancy Type

This section includes conceptual occupancy-specific recommendations based on the type of occupancy.

Additional Commercial and School Building Requirements and Recommendations

All retail, commercial, and office buildings would comply with appropriate building codes, including application of Chapter 7-A, ignition-resistant construction. The schools would comply with California State Architects Office requirements. Construction in this area would comply with CBC, Chapter 7-A, and would comply with other state requirements for fire safety. Access, water supply, and hydrant plans for the schools are subject to SDCFA approval.

7 WILDLAND FIRE EVACUATION PLAN

Early evacuation for any type of wildfire emergency at the Proposed Project is the preferred method of providing for resident safety, consistent with the SDCFA's current approach within San Diego County. As such, the Proposed Project's HOA would formally adopt, practice, and implement a "Ready, Set, Go!" (International Fire Chiefs Association 2013) approach to evacuation. The "Ready, Set, Go!" concept is widely known and encouraged by the State of California and most fire agencies. Pre-planning for emergencies, including wildfire emergencies, focuses on being prepared, having a well-defined plan, minimizing potential for errors, maintaining the Proposed Project's fire protection systems, and implementing a conservative (evacuate as early as possible) approach to evacuation and Project Area activities during periods of fire weather extremes.

Support for the "Ready, Set, Go!" model would be provided by preparation of a community Wildland Fire Evacuation Plan (WFEP) for the Proposed Project prior to occupancy. The WFEP would be based on standard evacuation planning used by San Diego County Office of Emergency Services. The WFEP would be reviewed to confirm that it provides Proposed Project residents with potential egress route information and instructions for following the "Ready, Set, Go!" model. The WFEP provides Project Area-specific procedures for wildfire evacuations, and once complete, would be provided to the Proposed Project's residents and commercial tenants, and posted on the community website. The WFEP would be reviewed by residents at least annually through organized meetings and educational outreach by the HOA, Community Services District, or other means.

The WFEP would form the backbone of hazard relocation/evacuation planning for the Proposed Project. Among the important concepts that would be included in the WFEP are a description of the area's fire environment, mitigation strategies, roles and responsibilities, homeowner education materials, preparedness checklist, route planning, and specific procedures for early relocation and contingency planning for situations where evacuation is considered unsafe.

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

Note that large-scale evacuations during wildfire or other emergencies are managed by agencies including the Office of Emergency Services, law enforcement, and fire agencies. Emergencies are often fluid events and on-scene emergency personnel provide key information and direction regarding evacuations. The WFEP would be a baseline document, focusing on evacuation routes

and pre-planning/preparedness. However, actual evacuation procedures would be a case-by-case basis and managed and controlled by the aforementioned agencies.

7.1 Wildfire Education

Proctor Valley Village residents and occupants of commercial facilities would be provided ongoing education regarding wildfire, the WFEP, and this FPP's requirements. This educational information would support the fire safety and evacuation features/plans designed for this community. Informational handouts, community website page, mailers, fire safe council participation, inspections, and seasonal reminders are some methods that would be used to disseminate wildfire and relocation awareness information. SDCFA would review and approve all wildfire educational material/programs before printing and distribution.

8 CUMULATIVE IMPACT ANALYSIS

Cumulative impacts from multiple projects within a fire agency's jurisdiction, like SDCFA, can cause fire response service decline and must be analyzed. The Proposed Project represents a substantial development that would increase the existing call volume by just under one call per day, on average. The resulting impact of the Proposed Project on fire services has been analyzed within this report and despite the population increase and anticipated call volume increase, the existing fire service delivery system is considered underutilized on a call volume basis, per an analysis of SDCFA call volume statistics[4] and has capacity to serve the Proposed Project. When compared to standard utilization rates for busy (five or six calls per day for a rural station) fire stations (Hunt 2010), it is clear there is capacity to serve the Proposed Project.

However, the system needs to be augmented to respond to a population change like that associated with this Proposed Project within a proportional timeframe. The County General Plan's 5-minute travel time standard is one part of the process for determining whether existing fire departments can respond to a project or whether additional resources are necessary. Further, when considered cumulatively with other potential projects planned in the area or within automatic aid response areas, the cumulative impact is considered potentially significant.

Despite the minor increase in number of calls per year from the Proposed Project, it contributes to the cumulative impact on fire services, when considered with other anticipated projects within the SDCFA's primary response area. The largest potential project in addition to the Proposed Project in this portion of SDCFA's jurisdictional area is Otay Resort Village (Village 13), which is pending approvals. Village 13 is anticipated to generate up to 1.8 calls per day and is situated in a portion of the SDCFA that cannot be completely responded to within the County's 5-minute travel time from existing stations. Village 13, like the Proposed Project, has been conditioned to provide a fire station that will meet the General Plan standard and be capable of responding to and assisting with calls beyond the project development, as requested. Based on the Proposed Project and the proposed Village 13 project, SDCFA has committed to realigning resources to better serve the area. Therefore, this portion of the County would have enhanced fire and emergency medical service if one or both projects are approved. These additional stations, if the Village 13 and the Proposed Project are approved and built, would mitigate cumulative impacts associated with the projects along with numerous smaller developments that may occur in the area.

[4] SDCFA Fire Station 36 currently responds to approximately one call per day (2012 statistics).

The Proposed Project's contributions to fire resources through building a new public safety center, along with funding for equipment and ongoing operations and maintenance, are expected to enhance SDCFA's response capabilities and enhance the current standards for firefighting and emergency response in this portion of the SDCFA. This fire station would also become part of the regional fire service delivery plan for the SDCFA for this portion of the county and would support fire and emergency service provision in the communities of Jamul, Dulzura, and Otay Mesa. Over the long term, it is anticipated that SDCFA would 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.

9 CONCLUSION

This FPP has been prepared for the proposed Otay Ranch Village 14 and Planning Areas 16/19. This FPP complies with the requirements of the 2017 County Consolidated Fire Code and the 2016 California Fire and Building Codes. The recommendations in this document meet fire safety, building design elements, infrastructure, fuel management/modification, and landscaping recommendations of the applicable codes. The recommendations provided in this FPP have been designed specifically for the proposed construction of structures within a WUI area.

When properly implemented on an ongoing basis, the fire protection strategies proposed in this FPP should significantly reduce the potential fire threat to vegetation on the community and its structures and should assist the fire authority in responding to emergencies in the Project Area. The Proposed Project'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 would be provided along with implementation of the latest ignition-resistant construction methods and materials. Further, all structures are required to include interior, automatic fire sprinklers consistent with the fire codes. Fuel modification would occur on perimeter edges adjacent to Otay Ranch RMP/MSCP Preserve and throughout the interior of the Proposed Project. This is a conceptual plan, which provides enough detail for SDCFA approval. Detailed plans such as improvement plans and building permits, demonstrating compliance with the concepts in this FPP and with Fire Code requirements, would be submitted to the fire authority at the time they are developed.

Based on the results of this FPP's analysis and findings, the FPP implementation measures presented in Table 7 summarize code-required measures, and Table 8 summarizes measures offered that are code exceeding or mitigating through alternative means and methods.

Table 7
Code-Required Fire Safety Features

Feature No.	Features Description
1	**Ignition-Resistant Construction.** Proposed Project buildings would be constructed of ignition-resistant construction materials based on the latest Building and Fire Codes.
2	**Interior Fire Sprinklers.** All structures over 500 square feet would include interior fire sprinklers.
3	**Fuel Modification Zones – Village 14.** Provided throughout the perimeter of the Development Footprint and would be up to 120 feet wide in most locations, including the rear yard areas as part of the modified zone. Maintenance would occur as needed, and the HOA would annually hire a third party, SDCFA-approved, FMZ inspector to provide annual certification that it meets the requirements of this FPP.

Table 7
Code-Required Fire Safety Features

Feature No.	Features Description
4	**Fuel Modification Zones – Large Lots.** One-acre and larger lots (lots designated as 1, 2, or 3 acres) would include fuel modification equal to 100 feet from all combustible buildings more than 250 square feet. The FMZs would begin at the structure and extend outward in all directions (front, sides, and rear of house). Homeowner's would be responsible for maintaining the FMZs, and they would be included in the annual HOA or approved management entity funded third-party inspections.
5	**Roadside Fuel Modification Zones.** Roadside FMZs would be consistent with the code for Village 14. FMZ width would be 20 feet on either side of all Proposed Project roads and 10 feet on either side along existing Proctor Valley Road. Planning Areas 16/19 would include 20-foot-wide FMZ except for connecting roads between neighborhoods, which would be 50 feet wide.
6	**LBZ.** Large lots in Planning Areas 16/19 would include LBZs where the properties are adjacent to open space areas. The LBZs would designate buffer areas where no building would be allowed. If a structure was built adjacent to the LBZ, then the LBZ can be maintained as an FMZ.
7	**Fire Apparatus Access.** Provided throughout the community and would vary in width and configuration, but would all provide at least the minimum required unobstructed travel lanes, lengths, turnouts, turnarounds, and clearances required by the applicable code.
8	**Firefighting Improvements.** Firefighting staging areas and temporary refuge areas are available throughout the Proposed Project's developed areas and along roadways and HOA open space.
9	**Water Availability**. Water capacity and delivery would provide for a reliable water source for operations and during emergencies requiring extended fire flow.
10	**Project area Fire Station.** Emergency response travel time consistent with the San Diego County General Plan requirement for the Proposed Project would be provided by a Project Area fire station. Travel times to all portions of the Project Area would be within General Plan standards, less than 5 minutes for most of the Proposed Project's developable lots and within 10 minutes for the rural residential lots in Planning Areas 16/19.

Table 8
Code Exceeding or Alternative Materials and Methods Fire Safety Measures

Measure No.	Code Exceeding or Alternative Material or Method Measure
1	**Construction Fire Prevention Plan.** Details the important construction phase restrictions and fire safety requirements that would be implemented to reduce risk of ignitions and pre-plans for responding to an unlikely ignition.
2	**Community Evacuation Plan.** A Proposed Project-specific evacuation plan would be prepared for the Proposed Project and would include input and review with SDCFA. (Code Exceeding)
3	**HOA Wildfire Education and Outreach.** The Community HOA would include an outreach and educational role to coordinate with SDCFA, oversee landscape committee enforcement of fire safe landscaping, ensure fire safety measures detailed in this FPP have been implemented, and educate residents on and prepare facility-wide "Ready, Set, Go!" plans. (Code Exceeding)

Table 8
Code Exceeding or Alternative Materials and Methods Fire Safety Measures

Measure No.	Code Exceeding or Alternative Material or Method Measure
4	**Heat Deflecting Landscape Walls.** Walls would be provided for 38 lots to provide additional fire protection and to enhance structure setback from top of slope. At a few locations, where FMZ is constrained to approximately 70 feet, walls would be provided as mitigation to provide same practical effect. (Alternative materials and methods for FMZ reductions in some locations. Also, a code exceeding measure as it is not required for structure setback.)
5	**Fuel Modification Zone Third-Party Inspections.** Annual FMZ and LBZ/LDA inspections would be funded by the HOA and conducted by a qualified third-party consultant to certify that the Proposed Project's FMZs are maintained and LBZ/LDA have no authorized structures.
6	**Planning Areas 16/19 Roadside Fuel Modification Zones.** Roadside FMZs would be 50 feet wide on either side of the road, 30 feet wider than required, where roads traverse open areas with adjacent native fuels. (Code Exceeding)
6	**Planning Areas 16/19 Fuel Modification Zone Maintenance Enforcement.** The HOA would be responsible for enforcing private property maintenance of large lot FMZs in Planning Areas 16/19. These FMZ areas would also be inspected by the third-party inspector. (Code Exceeding)
7	**Trail Maintenance.** Provided trails would include ongoing maintenance of flammable vegetation, not including alongside trails. (Code Exceeding)
8	**Wider Roads and Driveway Exclusion.** In Southern Procter Valley Village, Streets "A" and "M" include wider roads and do not have driveways, enabling free traffic flow and enhanced evacuation capability. (Code Exceeding)

Fire is a dynamic and somewhat unpredictable occurrence, and as such, this FPP does not guarantee that a fire will not occur or will not result in injury, loss of life, or loss of property. There are no warranties, expressed or implied, regarding the suitability or effectiveness of the recommendations and requirements in this FPP, under all circumstances.

The developers, contractors, engineers, and architects would be responsible for proper implementation of the concepts and requirements set forth in this FPP. Homeowners and property managers would be responsible to maintain their structures and lots as required by this FPP, the SDCFA, and as required by the Fire Code. Alternative methods of compliance with this FPP may be submitted to the fire authority and County Fire Marshal for consideration.

It will be extremely important for all homeowners, property managers, and occupants to comply with the recommendations and requirements described and required by this FPP on their property. The responsibility to maintain the fuel modification and fire protection features required for this Proposed Project lies with the homeowners and business owners. The HOA or similar entity would be responsible for ongoing education and maintenance of the common areas, and the fire authority would enforce the vegetation management requirements detailed in this FPP. Such requirements would be made a part of deed encumbrances and CC&Rs for each lot, as appropriate.

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APPENDIX A

Photograph Log

PHOTOGRAPH LOG

Otay Ranch Village 14 and Planning Areas 16/19

Photograph 1. Existing condition of Proctor Valley Road just east of Agua Vista Drive and Northwoods Drive intersection. Jamul Mountain range is visible in the background.

Photograph 2. View of fuel types and terrain outside of the southern boundary of the Project Area. Arizona crossing borders northern edge of Upper Otay Reservoir.

Photograph 3. Photograph depicts fuel types (short, non-native grasses in foreground; coastal sage scrub-rolling hills; and chamise chaparral-Jamul Mtn. slopes) used for fire scenario #1 adjacent to southern edge of Otay Ranch Village 14.

Photograph 4. SDG&E power line easement traverses from east to west through southern portion of Otay Ranch Village 14.

Photograph 5. Disturbed coastal sage scrub and non-native grasslands are present in designated preserve land adjacent to Village 14.

Photograph 6. View of fuel types in the eastern and central portions of property abutting Village 14 site. Majority of site is Diegan coastal sage scrub and chamise chaparral. Both fuel types were modeled in fire scenario #2.

Photograph 7. Close-up view of chamise chaparral and sage scrub fuel types.

Photograph 8. View of San Miguel Mountain (upper, left- side of photograph) and relatively flat terrain adjacent to southwest edge of Village 14.

Photograph 9. Photograph depicts chamise chaparral fuels at base of mountain range and coastal sage scrub on slopes. These fuel types just west and outside Project Area were modeled for fire scenario #6.

Photograph 10. View of fuel types in the northeastern portion of property. Majority of site is coastal sage scrub with patches of non-native grasslands and chamise shrubs.

Photograph11. Close-up of view of fuel types described in photograph 10.

Photograph 12. Looking north along Proctor Valley Road towards the community of Jamul. This portion of road will be improved to DPW standards.

Photograph 13. Photograph looking northwest of slopes vegetated with chamise chaparral-sage scrub fuels. This fuel bed was modeled for fire scenario #5.

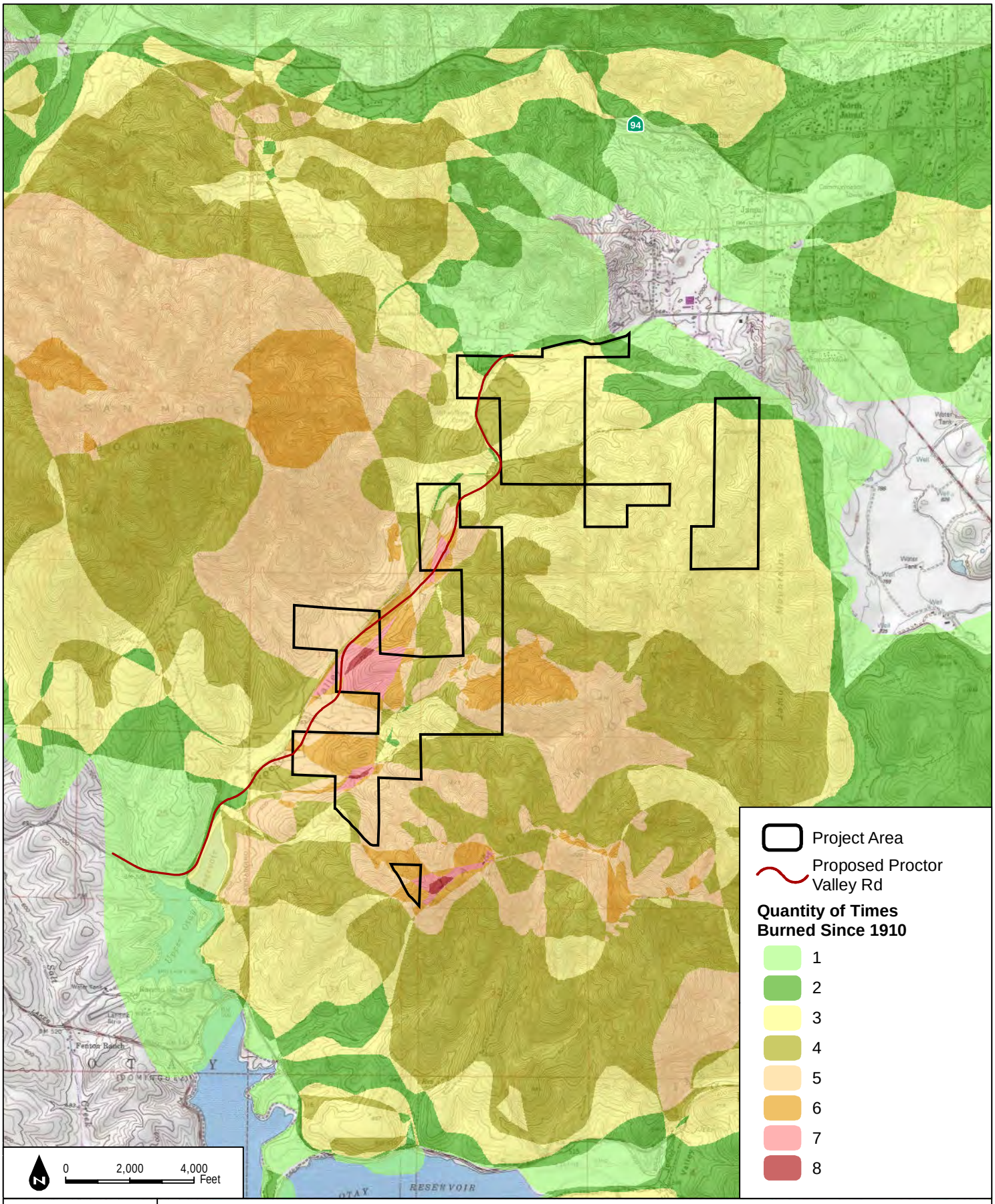
Photograph 14. Another view of fuel types in the northwestern portion of property. Majority of site is coastal sage scrub with patches of non-native grasslands and chamise shrubs.

Photograph 11. View of grasslands just south of Proctor Valley Road in the northern portion of the Project Area. Photo is looking toward the west.

Photograph 12. Looking south from Proctor Valley Road towards the northern portion of Otay Ranch Planning Areas 16/19. The grass (in foreground) and sage scrub covered hillsides (background) were modeled for fire scenario #4.

APPENDIX B

Fire History Exhibit



DUDEK

SOURCE: CalFire FRAP 2016; Hunsaker 2017

Appendix B

Fire History

Otay Ranch Village 14 and Planning Areas 16/19

APPENDIX C

Fire Service Availability Form

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

Please type or use pen

GDCI Proctor Valley, LP (619) 267-4904
Owner's Name Phone

2245 San Diego Ave, Suite 223
Owner's Mailing Address Street

San Diego CA 92110
City State Zip

ORG_____ **F**
ACCT_____
ACT_____
TASK_____
DATE_____ AMT $_____
DISTRICT CASHIER'S USE ONLY

SECTION 1. PROJECT DESCRIPTION — TO BE COMPLETED BY APPLICANT

A. ☒ Major Subdivision (TM) ☒ Specific Plan or Specific Plan Amendment
☐ Minor Subdivision (TPM) ☐ Certificate of Compliance:_____
☒ Boundary Adjustment
☐ Rezone (Reclassification) from_____ to_____ zone.
☐ Major Use Permit (MUP), purpose:_____
☐ Time Extension...Case No._____
☐ Expired Map...Case No._____
☒ Other General Plan Amendments

B. ☒ Residential ..... Total number of dwelling units 1,119
☒ Commercial ..... Gross floor area 10,000 square feet
☐ Industrial ..... Gross floor area_____
☐ Other ..... Gross floor area_____

C. Total Project acreage 1283 Total lots 995 Smallest proposed lot .09 acrs

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

SEE ATTACHED	

Thomas Guide, Page 1292 Grid C7
12800 Proctor Valley Road, Chula Vista, CA
Project address Street
Jamul Dulzura/Otay Subregion 91914
Community Planning Area/Subregion Zip

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

Applicant's Signature: _____ CEO of MANAGER Date: 10/20/2016
Address: 2245 San Diego Ave, Suite 223, San Diego, CA 92110 Phone: 619 267-4904
(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 Diego County Fire Authority
Indicate the location and distance of the primary fire station that will serve the proposed project:
New fire station to be located within the development

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

B. ☐ Based on the capacity and capability of the District's existing and planned facilities, fire protection facilities are currently adequate or will be adequate to serve the proposed project. The expected emergency travel time to the proposed project is _____ minutes.
☒ Fire protection facilities are not expected to be adequate to serve the proposed development within the next five years.

C. ☒ District conditions are attached. Number of sheets attached: 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.

☒ 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.

JAMES PINE, DFM 858.495.5434 10/21/16
Authorized Signature *Print Name and Title* *Phone* *Date*

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

Otay Ranch Proctor Valley Village 14 and Preserve
APNs By Ownership

Village 14

1. 598-070-09
2. 598-070-07
3. 598-010-02
4. 598-020-04
5. 598-020-06
6. 598-021-02
7. 597-140-05

Planning Areas 16/19

1. 597-020-10
2. 597-140-04
3. 597-020-06
4. 597-190-23
5. 597-150-13
6. 597-150-03
7. 597-150-12
8. 597-150-07
9. 597-150-08

HERMAN REDDICK
PROGRAM MANAGER
(858) 974-5999
FAX (858) 467-9662

County of San Diego

Public Safety Group
San Diego County Fire Authority
5510 Overland Ave, Suite 250, San Diego, CA 92123-1239
www.sdcountyfire.org

SUSAN QUASARANO
PROGRAM COORDINATOR
(858) 974-5924
FAX (858) 467-9662

October 21, 2016

GDCI Proctor Valley, LP
2245 San Diego Ave., Suite 223
San Diego, CA 92110

Ref: **Project Facility Availability Form (399F)**
Multiple APNs
Otay Ranch Villages 14,16,19 – Conditions

Following are the County Fire Marshal's Office comments in response to a request for a Project Facility Availability Form, and are preliminary in nature.

FIRE & EMERGENCY SERVICES - Availability

The density and location of the project will necessitate a new fire station to be provided within the project. The project will be conditioned to provide the funding for the construction, equipping and the ongoing operations and maintenance of the new fire station.

FIRE ACCESS ROADWAYS - Road design

1. Fire access roadways are required from building pads to a public way. The fire access roadway (including driveways) shall be extended to within 150 feet of acceptable fire fighter/hoseline access to all ground level exterior portions of proposed buildings.

2. Proposed on-site roadways will be required to meet DPW Public or Private Road Standards and designed to support the imposed load of fire apparatus (not less than 75,000 lbs.).

3. Due to the density of the project, on street parking shall be provided on both sides of the street to ensure that the minimum clear width of 24 feet is maintained at all times.

4. Cul-de-sacs shall have a paved radius of 42 feet to allow for on street parking within the cul-de-sac.

5. Any gates or other obstructions which could delay or otherwise impede emergency response are prohibited unless approved by the County Fire

Marshal and meet Department of Public Works Design Standards 17, 18 or 19, as well as the County Consolidated Fire Code.

6. Traffic calming devices (including, but not limited to, speed bumps, speed humps, speed control dips, etc.) shall be prohibited unless approved by the County Fire Marshal.

7. A vertical clearance of not less than 13 feet 6 inches shall be maintained.

8. No construction involving combustible materials on the subject property can take place until fire access roads are installed and fully meet code requirements. (Exception: If prearranged with the fire authority having jurisdiction, asphalt paving may be installed with the exception of the final lift, which may be postponed until just before building final if desired for roadway cosmetic purposes.)

FUEL MODIFICATION ZONES

1. The fuel modification zones around development areas shall be designed as to eliminate the presence of pockets, islands and peninsulas of unmanaged, combustible vegetation.

2. A fuel modification zone of not less than 100-foot is required around all structures, in accordance with the specifications of the County Consolidated Fire Code. Additional clearance may be required after review and acceptance of a fire protection plan (discussed below).

3. The fuel modification zone must be established and maintained by thinning, clearing away or modifying combustible vegetation within the zone. The fuel modification zone may be re-planted with either approved irrigated, fire-resistant planting material or approved non-irrigated, drought-tolerant, fire-resistant plant material. Re-planting with approved plant material may be required for erosion control.

   EXCEPTIONS:

   a) Single specimens of trees, ornamental shrubbery or similar plants used as ground covers, provided that they do not form a means of rapidly transmitting fire from the native growth to any structure.
   b) Grass and other vegetation located more than 50 feet from buildings or structures and less than 18 inches in height above the ground need not be removed where necessary to stabilize the soil and prevent erosion.

3. This does not authorize clearing beyond property line.

FIRE PROTECTION – Fire Protection Plan

A Fire Protection Plan, prepared by a PDS-approved consultant, shall be provided and be formatted per the County of San Diego Guidelines for Determining

Significance and Report Format and Content Requirements—Wildland Fire and Fire Protection.

FIRE PROTECTION – Automatic fire sprinklers

All structures shall be equipped with automatic fire sprinklers designed and installed to applicable NFPA and County of San Diego standards.

WATER SUPPLY—Fire hydrants and water mains

1. Fire hydrants shall be installed at intersections, at the beginning radius of cul-de-sacs and every 300 feet of fire apparatus access roadways.

2. The fire flow capacity for the water main serving the hydrants shall be a minimum of 2,500 gallons per minute.

3. Fire hydrants are be identified by a reflectorized blue marker, with a minimum dimension of 3 inches, in the center of the travel lane adjacent the water source, or by other methods approved by the fire code official.

IGNITION-RESISTIVE CONSTRUCTION (informational only)

At the time of building plan review, the Fire Marshal will check for fire code compliance with the County Consolidated Fire Code, County Building Codes, and other applicable standards. Plans will be reviewed for elements including (but not limited to):

- Class A roofing
- Non-combustible exterior walls
- Dual pane/tempered glazing
- Vent restrictions
- Eaves enclosed, not vented
- Smoke alarms
- Spark arresters
- Deck restrictions

Please call or email me if you have any questions or need clarification – (858) 495-5434 or James.Pine@sdcounty.ca.gov.

Best regards,

James Pine, Deputy Fire Marshal
San Diego County Fire Authority
Public Safety Group

APPENDIX D

Water Service Availability Form

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

Please type or use pen

GDCI Proctor Valley, LP — 619-267-4904
Owner's Name — Phone

c/o Jackson Pendo Development Company, 2245 San Diego Ave, Suite 223
Owner's Mailing Address — Street

San Diego — CA — 92110
City — State — Zip

ORG_____
ACCT_____
ACT_____
TASK_____
DATE_____ AMT $_____

W

DISTRICT CASHIER'S USE ONLY

SECTION 1. PROJECT DESCRIPTION — TO BE COMPLETED BY APPLICANT

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

B.
- [x] Residential . . . . . Total number of dwelling units 1,119
- [x] Commercial. . . . . Gross floor area 7,500 square feet
- [ ] Industrial . . . . . Gross floor area_____
- [x] Other . . . . . Gross floor area 9.7 acre school, 2.3 acre fire station, parks

C. [x] Total Project acreage 1,283.5 Total number of lots 995

D. Is the project proposing the use of groundwater? [ ] Yes [x] No
Is the project proposing the use of reclaimed water? [ ] Yes [x] No

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

SEE ATTACHED	

Thomas Guide Page 1292 Grid C7

12800 Proctor Valley Road, Chula Vista, CA
Project address — Street

Jamul Dulzura/Otay Subregion — 91914
Community Planning Area/Subregion — Zip

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

Applicant's Signature: _____, CEO of MANAGER Date: 10/19/2016

Address: 2245 San Diego Ave, Suite 223, San Diego, CA 92110 Phone: (619) 267-4904

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

SECTION 2: FACILITY AVAILABILITY — TO BE COMPLETED BY DISTRICT

District Name: OTAY WATER DISTRICT Service area WATER ID 22

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

B. [x] Facilities to serve the project [x] ARE [ ] ARE NOT reasonably expected to be available within the next 5 years based on the capital facility plans of the district. Explain in space below or on attached_____. (Number of sheets)

- [ ] Project will not be served for the following reason(s):_____

C.
- [x] **District conditions are attached. Number of sheets attached:**_____
- [ ] **District has specific water reclamation conditions which are attached. Number of sheets attached:**_____
- [ ] **District will submit conditions at a later date.**

D. [ ] **How far will the pipeline(s) have to be extended to serve the project?**_____

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

Authorized Signature: TRomero Print Name Tanya Romero

Print Title Permit Technician Phone (619) 470-2241 Date 10/25/16

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

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

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

...Dedicated to Community Service
2554 SWEETWATER SPRINGS BOULEVARD, SPRING VALLEY, CALIFORNIA 91978-2004
TELEPHONE: 670-2222, AREA CODE 619 www.otaywater.gov

Sent via USPS and email to:
rcameron@jacksonpendo.com

October 31, 2016

Project No.: D0956-090248
Activity: 3111

Rob Cameron
GDCI Proctor Valley, LP
c/o Jackson Pendo Development
2245 San Diego Avenue, Suite 223
San Diego, CA 92110

Subject: Project Facility Availability – Water
The Proctor Valley Village 14 Preserve Specific Plan and Planning Areas 16/19;
12800 Proctor Valley Road Chula Vista, CA

Dear Mr. Cameron:

This letter supersedes the previously written dated April 6, 2016. The Otay Water District (District) has the capacity to serve the Otay Ranch Village 14 (Project). As provided to the District, the Project consists of sixteen (16) parcels and nine hundred ninety-five (995) lots totaling approximately 1,283.5 total acreage.

As per Section 62.01 of the District's Code of Ordinances, "To provide for future line extensions, pipelines installed within public streets must be constructed to the subdivision boundary and pipelines not installed within a public street must be installed in a District easement or right-of-way and must extend across the frontage of the parcel or parcels to be served."

The District has no objection to this Project. The developer will be required to submit both a water demand study and a Water Supply Assessment and Verification report (WSA&V). The water study must be reviewed and approved by the District before the County of San Diego submits the request for a WSA&V report to the District. The developer should meet with the District early in the entitlement process to discuss the schedule, report submittal requirements, and to set up a deposit account to cover staff time. The developer will also be required to submit a Sub-Area Master Plan and a calculation of water demands prior to the commencement of the Project. An agreement between the developer and the District will be needed for the design and construction of water system improvements including transmission pipelines, reservoirs and pump stations required to support this development. In addition, the developer will be required to annex parcels into an improvement district for water service.

The developer will be required to submit improvement plans for District approval and extend the water main to front all properties in question. If service laterals do not exist for the Project, the applicant must pay to have the District install them.

Prior to the purchase of any meter(s), irrigation plans must be: (1) designed to District Water Agency Standards for reclaimed standards/specifications and (2) submitted to the District and the County Department of Environmental Health (DEH) for plan check and approval. The developer must contact the District for further requirements.

When a customer requests water service on a parcel of land with potable water irrigated landscape equal to 5,000 square-feet or more, a separate meter will be required for irrigation purposes on the site. Each service must have an approved reduced pressure principle backflow prevention device (R/P).

Fire service plans must be designed to Water Agencies' Standards. Each service must have an R/P purchased and installed by the developer after District review and approval. The developer should contact the Project's fire agency for any fire protection requirements and determine early on how the fire protection requirements can be met from the existing pressure zone.

The fire service line will not be allowed to be connected to any buildings; the line will be intended for fire services purposes only. Failure to comply with this request will result in violation of the District's Code of Ordinances and will be subject to penalties determined by the District. Water furnished for fire hydrant or fire sprinkler service shall be used only for fire protection purposes and shall be connected to a District water main. Where service is provided for a fire hydrant or fire sprinkler service on privately owned land, the service shall be provided by the District at the property line of land to be served

Water availability is subject to all District requirements in effect at the time and you are strongly encouraged to adopt water conservation measures throughout the development.

The District's Engineering Public Services Division can be contacted at (619) 670-2241 or visit the website at www.otaywater.gov/engineering for further requirements regarding inspection services, water main extensions, service laterals, backflow devices, meter costs. Also, visit the website at www.otaywater.gov/code-of-ordinances for sections pertaining to the Project and any other conditions that may have arisen since this letter was written for this Project.

Returned herewith are the documents you forwarded with your review request.

Sincerely,
OTAY WATER DISTRICT

Dan Martin, P.E.
Engineering Manager

DM:mlc

Enclosure: Documents submitted with review request

cc: County Of San Diego, Planning & Development Services – Zoning Counter (w/o enclosures)

Otay Ranch Proctor Valley Village 14 and Preserve
APNs By Ownership

Village 14

1. 598-070-09
2. 598-070-07
3. 598-010-02
4. 598-020-04
5. 598-020-06
6. 598-021-02
7. 597-140-05

Planning Areas 16/19

1. 597-020-10
2. 597-140-04
3. 597-020-06
4. 597-190-23
5. 597-150-13
6. 597-150-03
7. 597-150-12
8. 597-150-07
9. 597-150-08

COPY

OTAY WATER DISTRICT
..Dedicated to Community Service
2554 SWEETWATER SPRINGS BOULEVARD, SPRING VALLEY, CALIFORNIA 91978-2004
TELEPHONE: 670-2222, AREA CODE 619 www.otaywater.gov

Sent via USPS and email to:
rcameron@jacksonpendo.com

April 6, 2016

Project No.: D0956-090248
Activity: 3111

Rob Cameron
GDCI Proctor Valley, LP
c/o Jackson Pendo Development
2245 San Diego Avenue, Suite 223
San Diego, CA 92110

Subject: Project Facility Availability – Water
The Proctor Valley Village 14 Preserve Specific Plan and Planning Areas 16/19;
12800 Proctor Valley Road Chula Vista, CA

Dear Mr. Cameron:

The Otay Water District (District) has the capacity to serve the Otay Ranch Village 14 (Project). As provided to the District, the Project consists of thirty (30) parcels (approximately 2,347 total acreage).

As per Section 62.01 of the District's Code of Ordinances (enclosed), "To provide for future line extensions, pipelines installed within public streets must be constructed to the subdivision boundary and pipelines not installed within a public street must be installed in a District easement or right-of-way and must extend across the frontage of the parcel or parcels to be served."

The District has no objection to this Project. The developer will be required to submit both a water demand study and a Water Supply Assessment and Verification report (WSA&V). The water study must be reviewed and approved by the District before the County of San Diego submits the request for a WSA&V report to the District. The developer should meet with the District early in the entitlement process to discuss the schedule, report submittal requirements, and to set up a deposit account to cover staff time. The developer will also be required to submit a Sub-Area Master Plan and a calculation of water demands prior to the commencement of the Project. An agreement between the developer and the District will be needed for the design and construction of water system improvement including transmission pipelines, reservoirs and pump stations required to support this development. In addition, the developer will be required to annex parcels into an improvement district. The developer will be required to submit improvement plans for District approval and extend the water main to front all properties in question. If service laterals do not exist for the Project, the applicant must pay to have the District install them.

Prior to the purchase of any meter(s), irrigation plans must be: (1) designed to District Water Agency Standards for reclaimed standards/specifications and (2) submitted to the District and the County Department of Environmental Health (DEH) for plan check and approval. The developer must contact the District for further requirements.

When a customer requests water service on a parcel of land with potable water irrigated landscape equal to 5,000 square-feet or more, a separate meter will be required for irrigation purposes on the site.

Each service must have an approved reduced pressure principle backflow prevention device (R/P) purchased and installed by the developer. The fire service line will not be allowed to be connected to any buildings; the line will be intended for fire services purposes only. Failure to comply with this request will result in violation of the District's Code of Ordinances and will be subject to penalties determined by the District. Water furnished for fire hydrant or fire sprinkler service shall be used only for fire protection purposes and shall be connected to a District water main. Where service is provided for fire hydrant or fire sprinkler service on privately-owned land, the service shall be provided by the District at the property line of land to be served. The developer should contact the Project's fire agency for any fire protection requirements.

Water availability is subject to all District requirements in effect at the time and you are strongly encouraged to adopt water conservation measures throughout the development.

The District's Engineering Public Services Division can be contacted at (619) 670-2241 or visit the website at www.otaywater.gov for further requirements regarding inspection services, water main extensions, service laterals, backflow devices, meter costs, and any other conditions that may have arisen since this letter was written for this Project.

Also, returned herewith are the documents you forwarded with your review request.

Sincerely,
OTAY WATER DISTRICT

Dan Martin, P.E.
Engineering Manager

DM:mlc

Enclosures: Location Map
Code of Ordinances (Sections 9, 23, 25, 26, 27, 28, 36, 38, 39, 40, 60, 62)
Documents submitted with review request

COPY

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

Please type or use pen

GDCI Proctor Valley, LP — 619-267-4904
Owner's Name — Phone

c/o Jackson Pendo Development 2245 San Diego Ave, Suite 223
Owner's Mailing Address — Street

San Diego — CA — 92110
City — State — Zip

ORG_____
ACCT_____
ACT_____
TASK_____
DATE_____
AMT $_____

W

DISTRICT CASHIER'S USE ONLY

SECTION 1. PROJECT DESCRIPTION — TO BE COMPLETED BY APPLICANT

A.
- [x] Major Subdivision (TM)
- [ ] Minor Subdivision (TPM)
- [x] Boundary Adjustment
- [x] Rezone (Reclassification) from S80/S88/RR to S80/others zone.
- [ ] Major Use Permit (MUP), purpose:
- [ ] Time Extension...Case No.
- [ ] Expired Map...Case No.
- [x] Other General Plan Amendments
- [x] Specific Plan or Specific Plan Amendment
- [ ] Certificate of Compliance:

B.
- [x] Residential ..... Total number of dwelling units 1,530
- [x] Commercial ..... Gross floor area 15,000 square feet
- [ ] Industrial ..... Gross floor area
- [x] Other ..... Gross floor area 6.6 acre school, 2.3 acre fire, parks

C. [x] Total Project acreage 2,347 Total number of lots 1,316

D. Is the project proposing the use of groundwater? [ ] Yes [x] No
Is the project proposing the use of reclaimed water? [ ] Yes [x] No

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

SEE ATTACHED	

Thomas Guide Page 1292 Grid C7

12800 Proctor Valley Road, Chula Vista, CA
Project address — Street

Jamul Dulzura/Otay Subregion — 91914
Community Planning Area/Subregion — Zip

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

Applicant's Signature: CEO of MANAGER Date: 3/25/16

Address: 2245 San Diego Ave, Suite 223, San Diego, CA 92110 Phone: (619) 267-4904

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

SECTION 2: FACILITY AVAILABILITY — TO BE COMPLETED BY DISTRICT

District Name: OTAY WATER DISTRICT Service area Water ID 22

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

B. [x] Facilities to serve the project [x] ARE [ ] ARE NOT reasonably expected to be available within the next 5 years based on the capital facility plans of the district. Explain in space below or on attached_____. (Number of sheets)

- [ ] Project will not be served for the following reason(s):

C.
- [x] District conditions are attached. Number of sheets attached:
- [ ] District has specific water reclamation conditions which are attached. Number of sheets attached:_____
- [ ] District will submit conditions at a later date.

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

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

Authorized Signature: Tanya Romero Print Name Tanya Romero

Print Title PERMIT TECHNICIAN Phone (619) 670-2241 Date 4/5/16

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

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

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

Otay Ranch Proctor Valley Village 14 and Preserve
APNs as of 3-24-14

OLD 4/5/16

1. 598-070-09
2. 598-070-07
3. 598-010-02
4. 598-020-04
5. 598-020-06
6. 598-021-02
7. 597-140-05
8. 597-020-10
9. 597-140-04
10. 597-020-06
11. 597-190-23
12. 597-150-13
13. 597-150-03
14. 597-150-12
15. 597-150-07
16. 597-150-08
17. 597-140-08 (portion)
18. 598-011-01
19. 598-021-01
20. 597-130-13 (portion)
21. 597-140-01 (portion)
22. 597-140-06
23. 597-140-07 (portion)
24. 597-140-09 (portion)
25. 597-210-03
26. 597-210-02
27. 597-150-11
28. 597-150-14
29. 597-210-03
30. 597-160-01

NEW 10/25/16

APPENDIX E

Fire Behavior Modeling Input Data

APPENDIX E
Fire Behavior Modeling
Otay Ranch Village 14 and Planning Areas 16/19

BEHAVEPLUS FIRE BEHAVIOR MODELING

Fire behavior modeling has been used by researchers for approximately 50 years to predict how a fire will move through a given landscape (Linn 2003). The models have had varied complexities and applications throughout the years. One model has become the most widely used as the industry standard for predicting fire behavior on a given landscape. That model, known as "BEHAVE", was developed by the U. S. Government (USDA Forest Service, Rocky Mountain Research Station) and has been in use since 1984. Since that time, it has undergone continued research, improvements, and refinement. The current version, BehavePlus, 5.0.5, includes the latest updates incorporating years of research and testing. Numerous studies have been completed testing the validity of the fire behavior models' ability to predict fire behavior given site specific inputs. One of the most successful ways the model has been improved has been through post-wildfire modeling (Brown 1972, Lawson 1972, Sneeuwjagt and Frandsen 1977, Andrews 1980, Brown 1982, Rothermel and Rinehart 1983, Bushey 1985, McAlpine and Xanthopoulos 1989, Grabner, et. al. 1994, Marsden-Smedley and Catchpole 1995, Grabner 1996, Alexander 1998, Grabner et al. 2001, Arca et al. 2005). In this type of study, Behave is used to model fire behavior based on pre-fire conditions in an area that recently burned. Real-world fire behavior, documented during the wildfire, can then be compared to the prediction results of Behave and refinements to the fuel models incorporated, retested, and so on.

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 three representative fuel models observed on 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 five custom fuel models developed for Southern California (Weise 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 software was used in the development of this fire protection plan (FPP) in order to evaluate potential fire behavior for the Project site. Existing site conditions were evaluated, and local weather data was incorporated into the BehavePlus modeling runs.

BEHAVEPLUS FUEL MODEL INPUTS

Dudek utilized BehavePlus software to evaluate fire behavior potential for the project site. Six fire scenarios were evaluated, including three summer, onshore weather conditions and three more extreme fall, offshore weather conditions. BehavePlus software requires site-specific variables for surface fire spread analysis, including fuel type, fuel moisture, wind speed, and slope data. The output variables used in this analysis include flame length (feet), rate of spread (feet/minute), and fireline intensity (BTU/feet/second). The following provides a description of the input variables used in processing the BehavePlus models for the project site. In addition, data sources are cited and any assumptions made during the modeling process are described.

Vegetation/Fuel Models

To support the fire behavior modeling efforts conducted for this FPP, the different vegetation types observed on and adjacent to the site were classified into the aforementioned numeric fuel models. Vegetation types were derived from vegetation mapping data (Dudek 2015) for the project site. The site and off site vegetation consists primarily of Diegan coastal sage scrub (Fuel Model SCAL 18), chamise chaparral (Fuel Model Sh5), and short grasses (Fuel Model 1). Modeled areas include the non-native grasslands to the north, east, and south of the project site. Coastal sage scrub and chamise chaparral occur on the slopes to the north, southeast, and west of the site. A total of six fire modeling scenarios were completed for the Project area. These sites were selected based on the strong likelihood of fire approaching from these directions during an

on-shore weather pattern (fire scenarios 1, 5, and 6) and during a Santa Ana wind-driven fire event (fire scenarios 2, 3, and 4).

Topography

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 downhill as uphill vegetation is pre-heated and dried in advance of the flaming front, resulting in faster ignition rates. Slope values ranging from 5% to 40% were measured around the perimeter of the proposed project site from U.S. Geological Survey (USGS) topographic maps and current topography that was flown by Dudek.

Weather Analysis

In order to evaluate specific weather variables for the Project area, data from the San Miguel Remote Automated Weather Station (RAWS) was analyzed. The San Miguel RAWS is the closest RAWS, located approximately 3.2 miles due northwest of the Project site, in a similar inland position and estimated to include consistent weather conditions as the Project area. The location and available data range for the San Miguel station is:

- San Miguel RAWS
  - Latitude: 32.68611
  - Longitude: -116.97833
  - Elevation: 425 feet
  - Data years: 2002 to 2010

Utilizing the FireFamily Plus v. 4.0.2 (FireFamily Plus 2008) software package, data from the San Miguel RAWS was processed and analyzed to determine 50th (typical) and 97th (extreme) percentile wind and fuel moisture conditions to be used in the fire behavior modeling efforts conducted for the Project area. Wind speed values derived from RAWS data represent 20-foot wind speeds. As such, a wind adjustment factor of 0.4 was utilized to account for vertical differences in wind speed from the 20-foot recording height to mid-flame height prior to BehavePlus modeling efforts. Standard RAWS setup places the anemometer at 20 feet above ground, while wind affecting surface fire spread is that found at mid-flame height. A conservative wind adjustment factor of 0.4 indicates a fuel bed that is unsheltered from the wind with a fuel bed depth roughly 3.0 feet. It should be noted that mid-flame wind speeds may be only 10% of the wind speeds recorded or predicted at 20 feet. Fuel moisture information derived from FireFamily Plus was directly inputted into the BehavePlus runs. Two separate wind

scenarios were analyzed and incorporated into the BehavePlus model: summer fire (50th percentile values from June 1 to August 31) with 8 mph on-shore winds, and fall fire (97th percentile values from September 1 to November 30) with 30 to 50 mph winds. The use of 50 mph winds in modeling efforts is intended to represent wind gusts rather than sustained maximum wind speeds (30-40 mph). The maximum RAWS wind speed for the San Miguel RAWS during the 97th percentile weather period (September 1 to November 30) was 20 mph, which represents a 10-minute average wind speed, not the maximum gust speed. As BehavePlus presents a static representation of fire behavior, the inclusion of gust speed is appropriate to evaluate worst-case fire behavior outputs. Table 2 summarizes the weather and wind input variables used for all fire behavior modeling conducted for this FPP.

Table 2
BehavePlus Fire Behavior Model Variables

Variable	Summer Weather (Onshore Flow) 50th Percentile	Peak Weather (Offshore Flow) 97th Percentile
Fire Modelling Scenarios	1, 5, 6	2 , 3, 4
Fuel Model(s)	FM 1, Sh5, SCAL 18	FM 1, Sh5,SCAL 18
1h Moisture	8%	2%
10h Moisture	10%	3%
100h Moisture	15%	7%
Live Herbaceous Moisture	90%	60%
Live Woody Moisture	122%	92%
20-ft Wind Speed	8 mph	30-40 mph (50 mph gusts)
Wind Adjustment Factor (BehavePlus)	0.4	0.4
Slope Steepness	5-40%	10-30%

Fire Modeling Scenarios

Focused fire behavior modeling utilizing BehavePlus 5.0.5 was conducted for the Project. Based on slope and fuel conditions, six different fire scenarios were evaluated for the project site, including:

- **Scenario 1:** 50th percentile weather with on-shore wind and a summer fire burning in grassland with sparse sage scrub and chamise chaparral shrub cover along the southern edge of the Project site. This area is relatively flat (5% slope) to moderately slope (20%), with potential ignition sources along adjacent residential areas, a transmission line, or off-road recreational vehicles. Fire in this area would be moving slightly uphill toward the proposed Project.
- **Scenario 2:** 97th percentile weather with off-shore wind and a fall fire burning in chamise chaparral and coastal sage scrub shrub cover in rugged terrain along the eastern

edge of the Project site. This area is moderately steep (20 to 30% slope), with potential ignition sources from off-road vehicles, or from a larger fire burning westward over the Jamul Mountains that could have started near SR-94 to the east. Fire in this area would be moving downhill toward the proposed Project.

≠ **Scenario 3:** 97th percentile weather with off-shore wind and a fall fire burning in grasslands and coastal sage scrub shrub cover in gentle terrain along the northeastern portion of the Project site. This area is starts off as relatively flat terrain (10%) and then abruptly becoming moderately steep slopes (27%). Potential ignition sources could be off-road vehicle activity or from a larger fire burning westward from the Dulzura area and SR-94 to the east. Fire in this area would be moving downhill toward the proposed Project.

≠ **Scenario 4:** 97th percentile weather with off-shore wind and a fall fire burning in grasslands and coastal sage scrub shrub cover in gentle, undulating terrain along the northern portion of the Project site. This area is rolling hills with roughly 10% - 15% slopes. Potential ignition sources could be adjacent residential areas in Jamul or off-road vehicle activity. Fire in this area would be moving upslope toward the proposed Project.

≠ **Scenario 5:** 50th percentile weather with on-shore wind and a summer fire burning in grasslands, or chamise and sage scrub shrub cover along the western edge of the project site. This area is moderately steep (20% slope) with potential ignition sources from a larger fire burning eastward over the Jamul Mountains. Fire in this area would be moving downhill toward the proposed Project.

≠ **Scenario 6:** 50th percentile weather with on-shore wind and a summer fire burning in chamise and sage scrub shrub cover along the southwestern edge of the project site. This area is steep (up to 40% slope), with potential ignition sources from a transmission line or a wildfire that originates in the San Diego National Wildlife Refuge to the west of the Proctor Valley. Fire in this area would be moving downhill toward the proposed Project.

FIRE BEHAVIOR MODELING EFFORT

As mentioned, the BehavePlus fire behavior modeling software package was utilized in evaluating anticipated fire behavior within and adjacent to proposed fuel modification zones for the Village 14 and Planning area 16/19 project site. Six focused analyses were completed, each assuming worst-case fire weather conditions for a fire approaching the project site from the northeast, east, west, and south. Three fire behavior variables were selected as outputs from the BehavePlus analysis conducted for the project 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). . 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 (Rothermel 1983). 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. Identification of modeling run locations is presented graphically in Figure 5 of the FPP.

Based on the BehavePlus analysis, worst-case fire behavior is expected in sage scrub fuels along the northern and eastern edges of proposed project development (Scenarios 2, 3 , and 4) during a strong wind-driven fire event (97th percentile weather with 50 mph gusts). Under this scenario, maximum modeled flame lengths reach 34.3 feet, fireline intensities reach 12,338 BTU/feet/second, and spread rates reach 2.0 mph.

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.
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.

Table 4
BehavePlus Fire Behavior Modeling Results

Fire Scenario	Flame Length (feet)	Spread Rate (mph)	Fireline Intensity (Btu/ft/s)	Spot Fire (miles)
Scenario 1: 5-20% - flat to upslope; Summer weather condition				
Short grass (FM 1)	2.8	<1.0	52	0.1
Chamise chaparral (SH5)	9.1	<1.0	697	0.2
Sage scrub (SCAL18)	10.7	<1.0	984	0.3
Scenario 2: 20-30% – downslope; Peak weather Condition				
Chamise chaparral (SH5)	30.2 (34.2)	3.3 (4.4)	9,372 (12,229)	1.6 (2.0)
Sage scrub (SCAL18)	30.6 (33.7)	1.6 (1.9)	9,655 (11,868)	1.6 (2.0)
Scenario 3: 10-27% - upslope; Peak Weather Condition				
Short grass (FM 1)	12.7 (12.7)	8.3 (8.3)	1,415 (1,415)	0.9 (1.0)
Sage scrub (SCAL18)	31.3 (34.3)	1.6 (2.0)	10,125 (12,338)	1.6 (2.0)

Table 4
BehavePlus Fire Behavior Modeling Results

Fire Scenario	Flame Length (feet)	Spread Rate (mph)	Fireline Intensity (Btu/ft/s)	Spot Fire (miles)
Scenario 4: 5-15% - upslope; Peak Weather Condition				
Short grass (FM 1)	12.7 (12.7)	8.3 (8.3)	1,415 (1,415)	0.9 (1.0)
Sage scrub (SCAL18)	31.0 (34.0)	1.6 (1.9)	9,888 (12,101)	1.6 (2.0)
Scenario 5: 20% - downslope; Summer weather condition				
Short grass (FM 1)	3.0	<1.0	62	0.1
Chamise chaparral (SH5)	9.5	<1.0	759	0.2
Sage scrub (SCAL18)	11.1	<1.0	1,057	0.3
Scenario6:: 40% – downslope; Summer weather Condition				
Chamise chaparral (SH5)	7.6	<1.0	462	0.2
Sage scrub (SCAL18)	9.2	<1.0	706	0.2

Note:

* Parentheses represents modeling results for 50 mph wind gusts.

** It should be noted that the results presented in Table 4 depict values based on inputs to the BehavePlus software. Changes in slope, weather, or pockets of different fuel types are not accounted for in this analysis. Further, this modeling analysis assumes a correlation between the project site vegetation and fuel model characteristics. 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.

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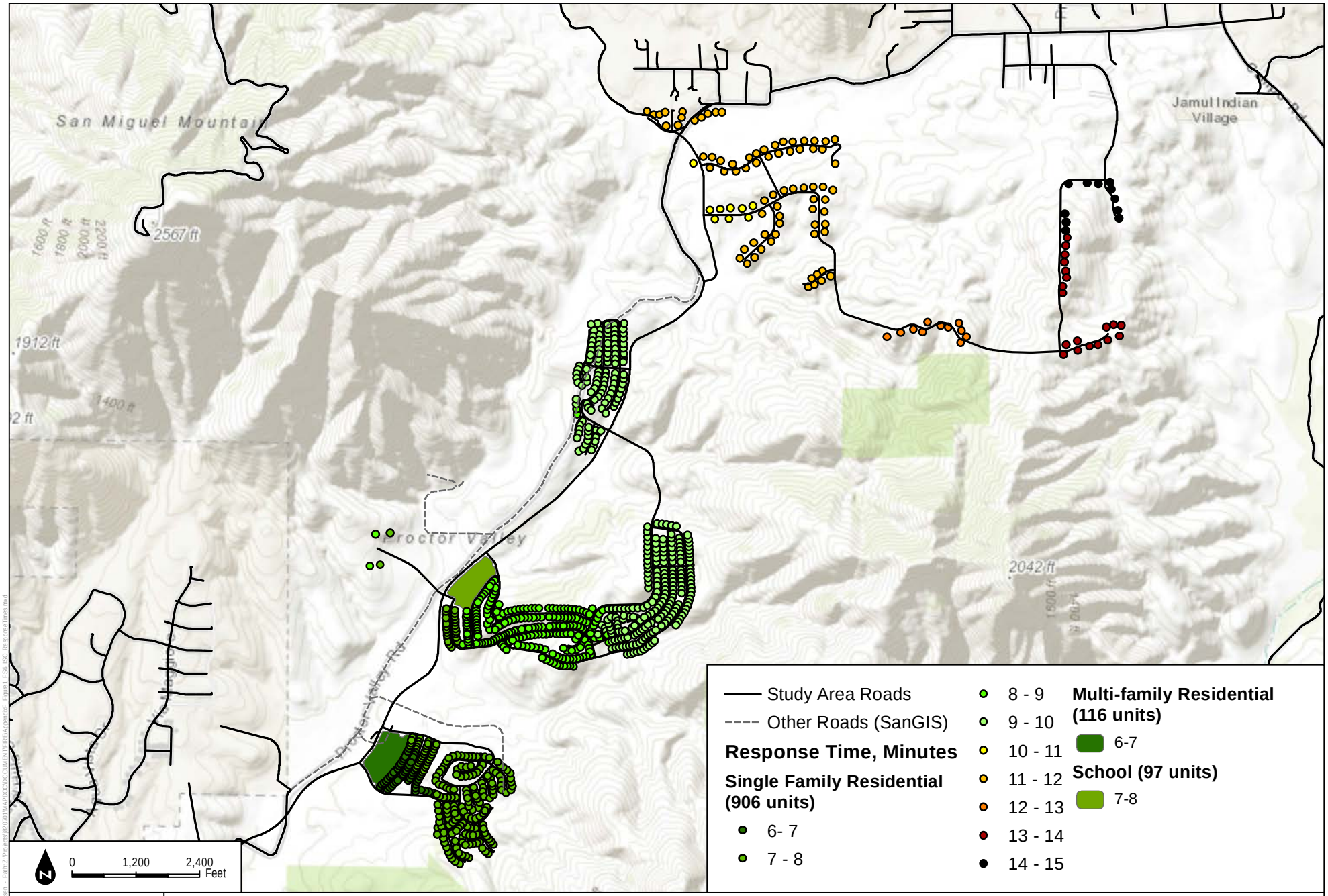
APPENDIX F

Fire Department Travel Time Analysis (Figures)



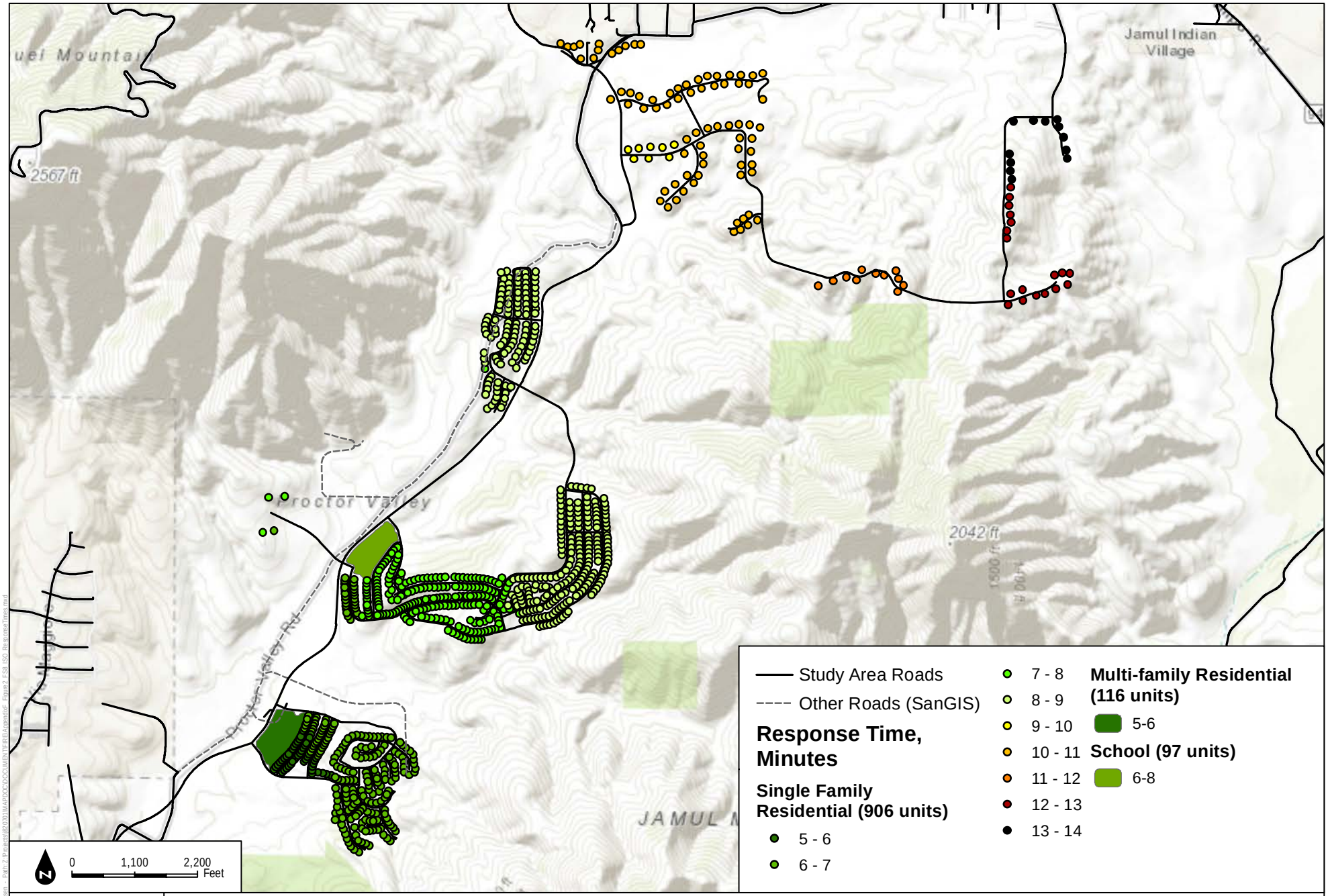
DUDEK

SOURCE: ESRI 2015; SANGIS 2015; Hunsaker 2015

APPENDIX F-1

Fire Station 6 - ISO Response Analysis

Otay Ranch Village 14 and Planning Areas 16/19



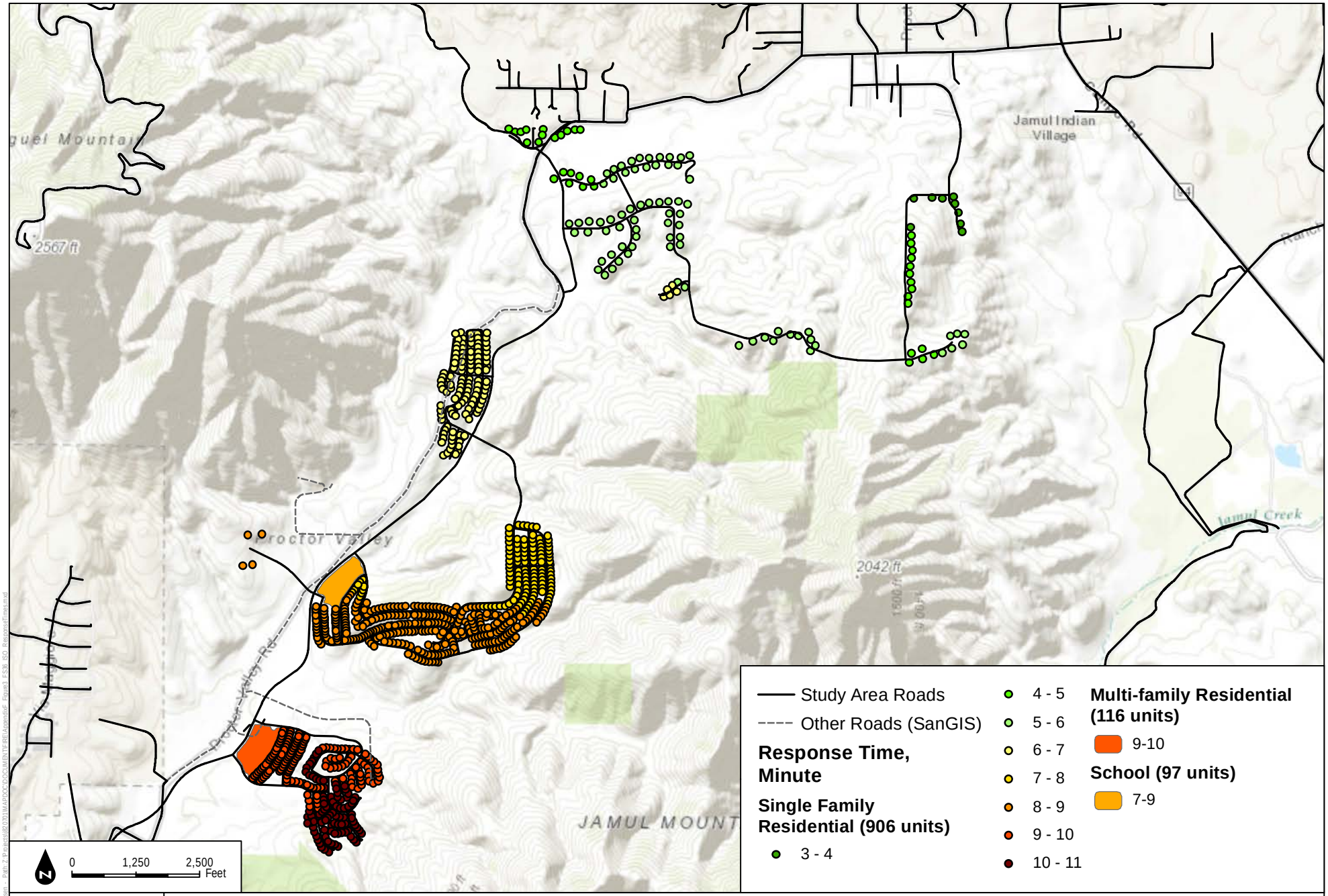
DUDEK

SOURCE: ESRI 2015; SANGIS 2015; Hunsaker 2015

APPENDIX F-2

Fire Station 8 - ISO Response Analysis

Otay Ranch Village 14 and Planning Areas 16/19



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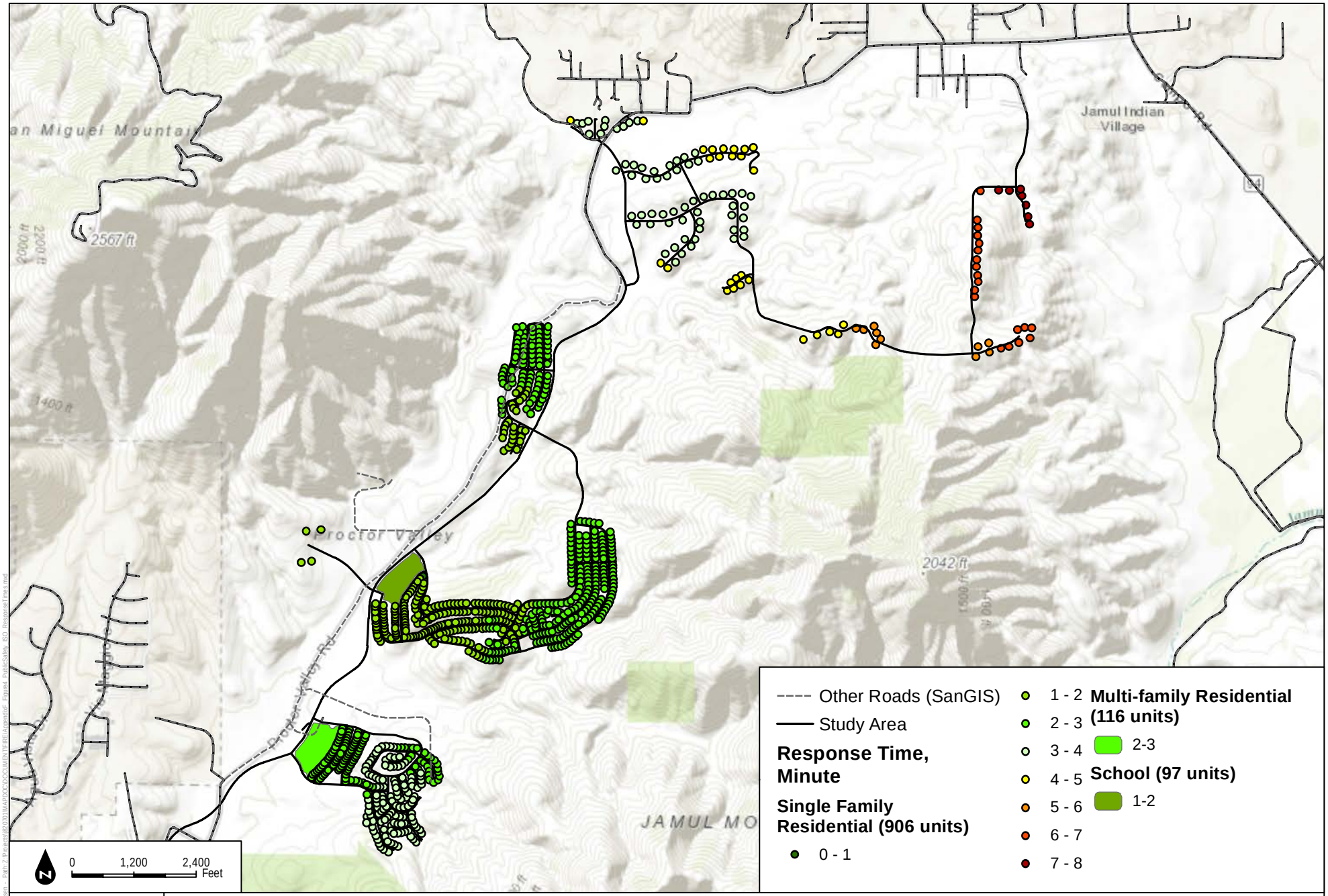
SOURCE: ESRI 2015; SANGIS 2015; Hunsaker 2015

APPENDIX F-3

Fire Station 36 - ISO Response Analysis

Otay Ranch Village 14 and Planning Areas 16/19



DUDEK

SOURCE: ESRI 2015; SANGIS 2015; Hunsaker 2015

APPENDIX F-4

Proposed Public Safety Site - ISO Response Analysis

Otay Ranch Village 14 and Planning Areas 16/19

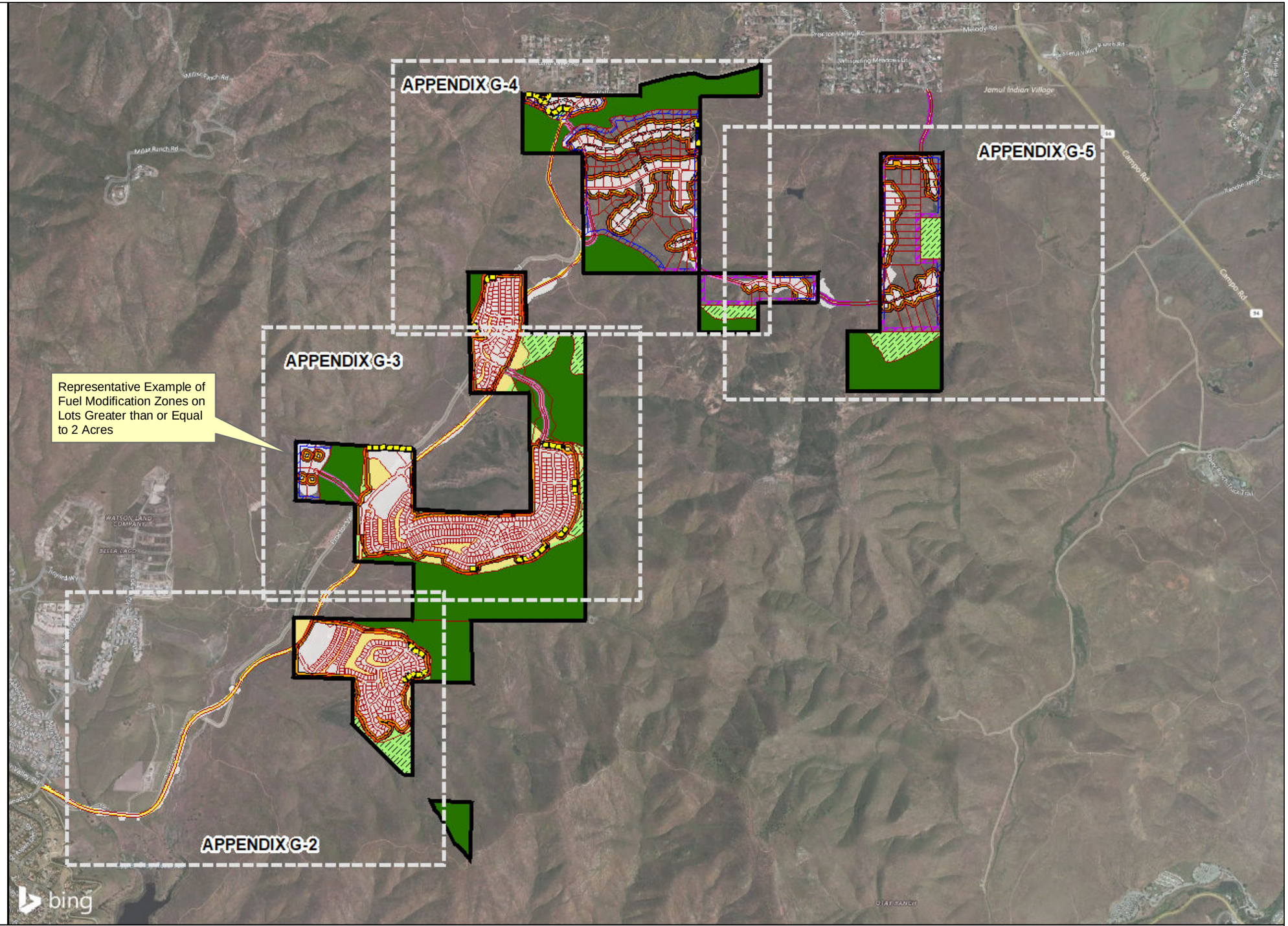
APPENDIX G

Fuel Modification Zone Exhibits

- Project Area
- Open Space Preserve
- Conserved Open Space
- HOA Open Space
- Maintained Landscape (HOA or other Entity)

Fuel Modification Zone

- Zone A, 50-foot (Typical)
- Zone B, 50-foot (Typical)
- Proctor Valley Rd Roadway Zone, 10-foot
- Onsite Roadway Zone, 20-foot
- Onsite Roadway Zone, 50-foot
- Offsite Roadway Zone, 50-foot
- 100' FMZ in LDA
- 100' Limited Building Zone in Development (outside of LDA)
- Perimeter Fire Wall



0 1,000 2,000 Feet

SOURCE: AERIAL-BING MAPPING SERVICE; DEVELOPMENT-HUNSAKER & ASSOCAITES 2018

DUDEK

APPENDIX G-1

Fuel Modification Zone Index Map

Otay Ranch Village 14 and Planning Areas 16/19

SOURCE: AERIAL-SANDAG IMAGERY 2014; DEVELOPMENT-HUNSAKER & ASSOCAITES 2018

DUDEK

APPENDIX G-2

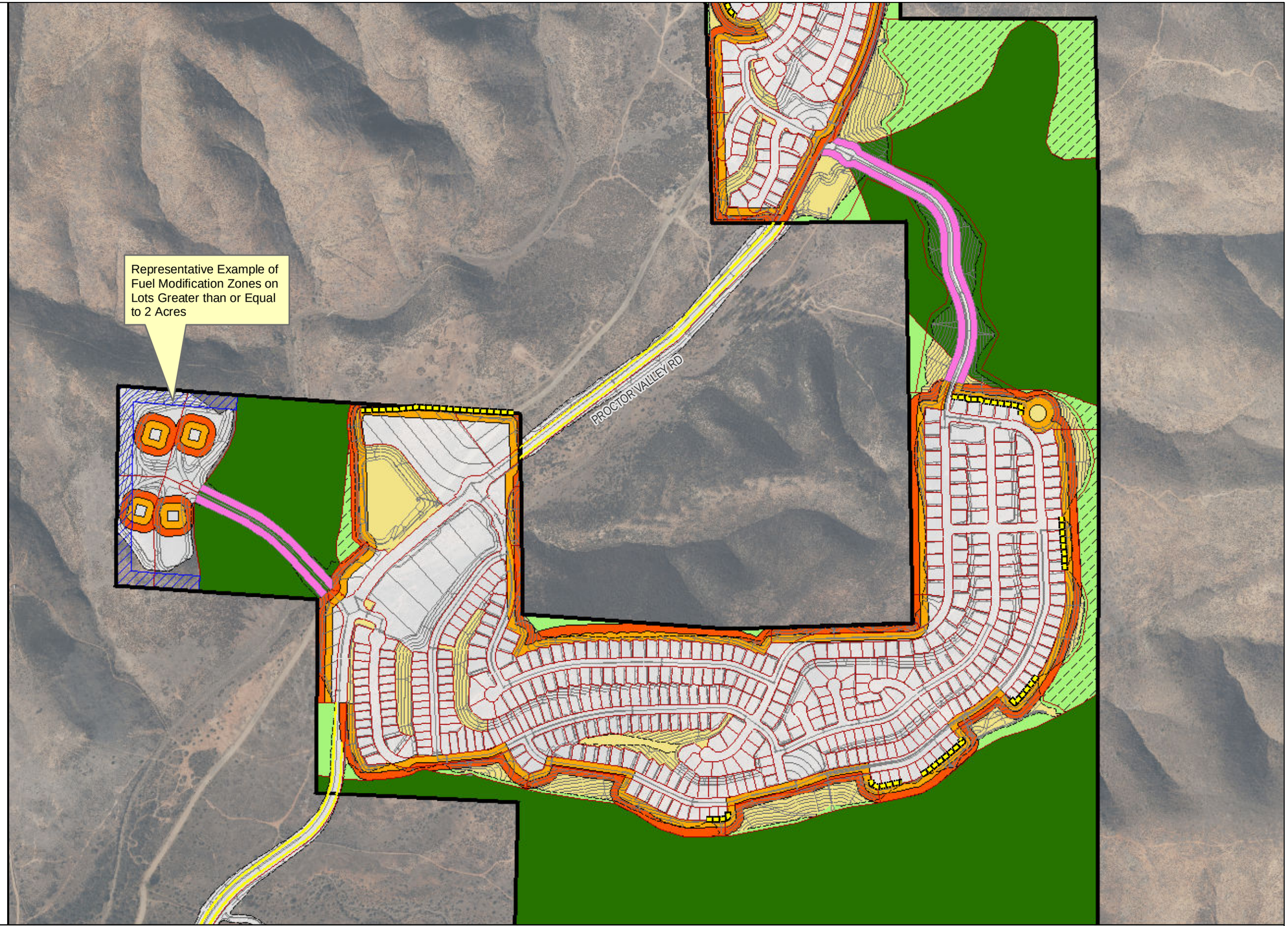
Fuel Modification Zone Map - Village 14

Otay Ranch Village 14 and Planning Areas 16/19

- Project Area
- Open Space Preserve
- Conserved Open Space
- HOA Open Space
- Maintained Landscape (HOA or other Entity)

Fuel Modification Zone

- Zone A, 50-foot (Typical)
- Zone B, 50-foot (Typical)
- Proctor Valley Rd Roadway Zone, 10-foot
- Onsite Roadway Zone, 50-foot
- 100' Limited Building Zone in Development (outside of LDA)
- Perimeter Fire Wall



N 0 325 650 Feet

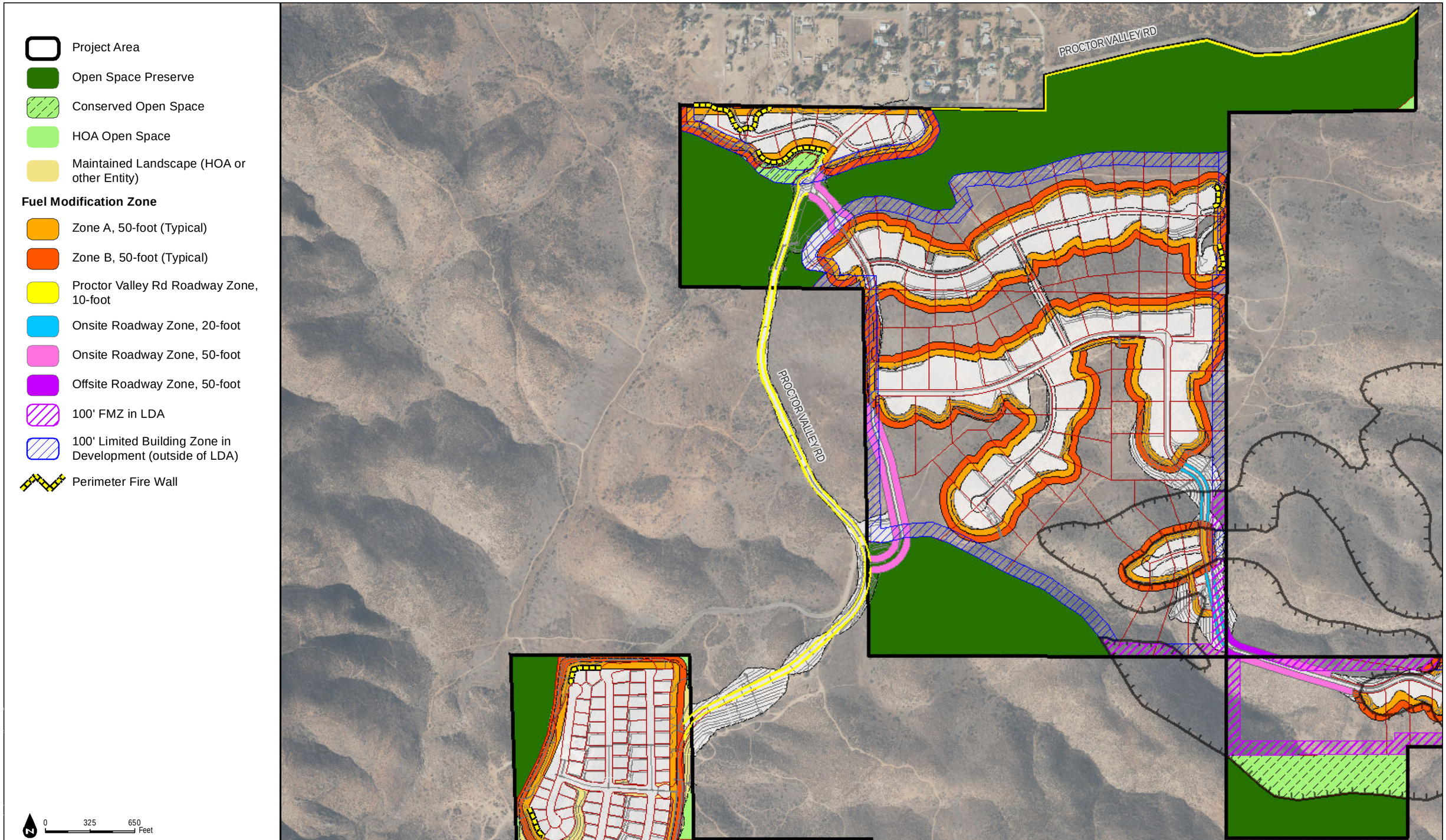
SOURCE: AERIAL-SANDAG IMAGERY 2014; DEVELOPMENT-HUNSAKER & ASSOCAITES 2018

DUDEK

APPENDIX G-3

Fuel Modification Zone Map - Village 14

Otay Ranch Village 14 and Planning Areas 16/19

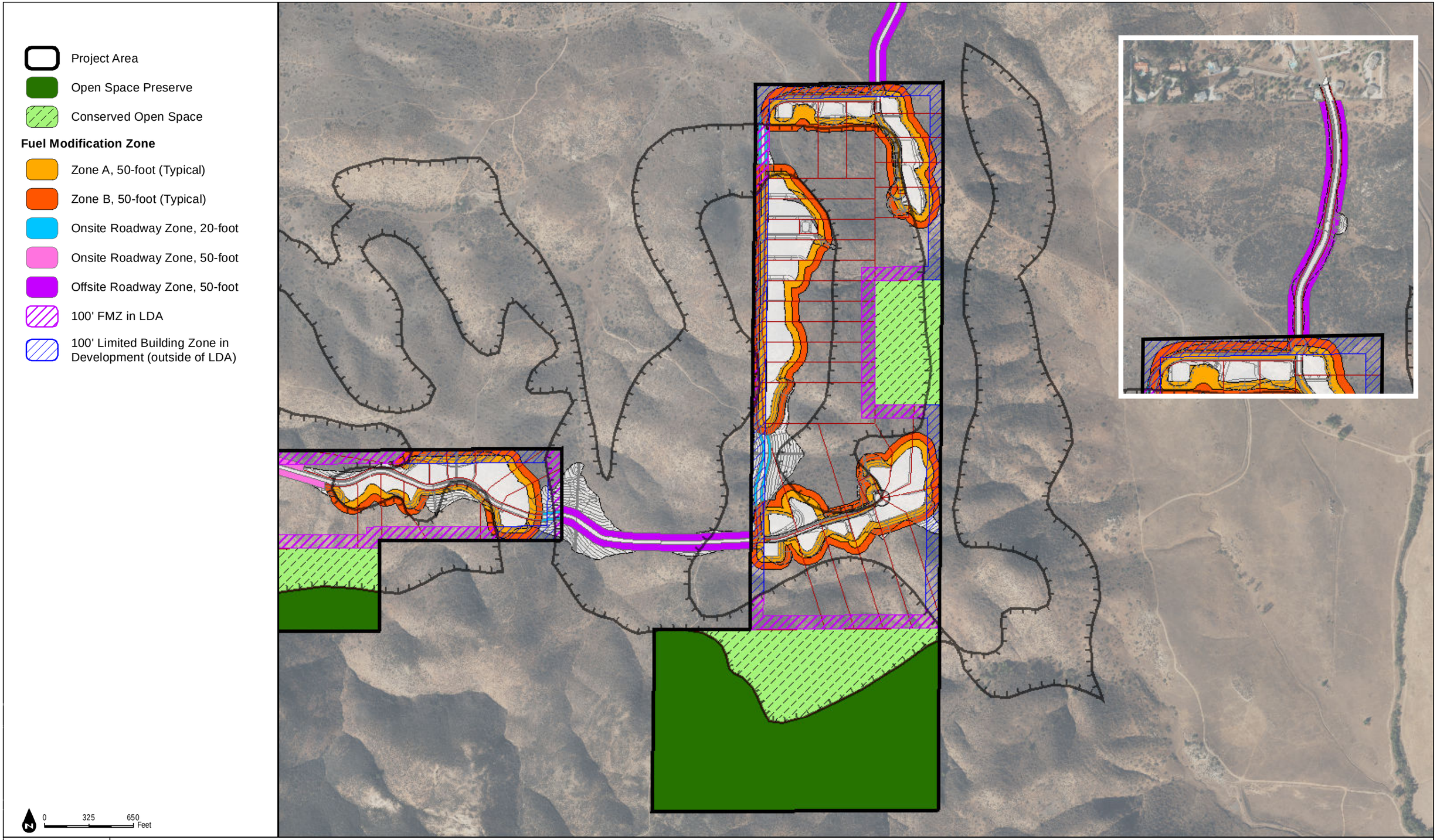


SOURCE: AERIAL-SANDAG IMAGERY 2014; DEVELOPMENT-HUNSAKER & ASSOCAITES 2018

DUDEK

APPENDIX G-4

Fuel Modification Zone Map - Village 14 and Planning Areas 16/19



SOURCE: AERIAL-SANDAG IMAGERY 2014; DEVELOPMENT-HUNSAKER & ASSOCAITES 2018

DUDEK

APPENDIX G-5

Fuel Modification Zone Map - Planning Areas 16/19

APPENDIX H

Proposed Project Suggested Plant List

APPENDIX H
SUGGESTED PLANT LIST FOR A DEFENSIBLE SPACE

BOTANICAL NAME	COMMON NAME	Climate Zone
TREES		
Acer		
platanoides	Norway Maple	M
rubrum	Red Maple	M
saccharinum	Silver Maple	M
saccarum	Sugar Maple	M
macrophyllum	Big Leaf Maple	C/ (R)
Agonis flexuosa	Peppermint Tree	
Alnus rhombifolia	White Alder	C/I/M (R)
Arbutus		
unedo	Strawberry Tree	All zones
Archontophoenix		
cunninghamiana	King Palm	C
Arctostaphylos spp.**	Manzanita	C/I/D
Brachychiton		
acerifolius	Australian Flame Tree	
Brachychiton		
populneus	Bottle Tree	
Brahea		
armata	Blue Hesper Palm	C/D
edulis	Guadalupe Palm	C/D
Callistemon citrinus		
Compacta	Dwarf Lemon Bottlebrush	
Ceratonia siliqua	Carob	C/I/D
Cerdidium floridum	Blue Palo Verde	D
Cercis occidentalis**	Western Redbud	C/I/M
Chamaerops	Mediterranean Fan Palm	
humillis		
Cornus		
nuttallii	Mountain Dogwood	I/M
stolonifera	Redtwig Dogwood	I/M
Cupressus	Italian Cypress	
semperv		
irens		
Strica		
Cycas	Sago Palm	
revoluta		
Eriobotrya		C/I/D
japonica	Loquat	C
Erythrina caffra	Kaffirboom Coral Tree	I/M
Ficus robiginosa	Rustyleaf Fig	
Geijera parviflora	Australian Willow	
Gingko biloba "Fairmount"	Fairmount Maidenhair Tree	I/D/M

BOTANICAL NAME	COMMON NAME	Climate Zone
Gleditisia triacanthos	Honey Locust	
Juglans		I
californica	California Walnut	C/I
hindsii	California Black Walnut	I/D/M
Koelreuteria paniculata	Golden Rain Tree	
Lagerstroemia indica	Crape Myrtle	I
Laurus nobils	Sweet Bay	
Ligustrum japonicum	Japanese	
'Texanum'	Privet	
Ligustrum lucidum	Glossy Privet	C/I/M
Liquidambar styraciflua	Sweet Gum	I
Liriodendron tulipifera	Tulip Tree	
Lyonothamnus floribundus		C
ssp. Asplenifolius	Fernleaf Catalina Ironwood	C/I/D
Melaleuca spp.	Melaleuca	C/I
Metrosideros exelsus	New Zealand Christmas Tree	
Olea europea Wilsoni	Fruitless Olive Tree	
Parkinsonia aculeate	Mexican Palo Verde	
Phoenix canariensis Phoenix	Canary Island Date Palm	
dactylifera	Phoenix Date Palm	
Phoenix reclinata	Senegal Date Palm	
Phoneix roebelenii	Pigmy Date Palm	
Pistacia	Chinese Pistache	
chinensis	Pistachio Nut	C/I/D
vera	Pistachio Nut	I
Pittosporum		
phillyraeoides	Willow Pittosporum	C/I/D
viridiflorum	Cape Pittosporum	C/I
Platanus		
acerifolia	London Plane Tree	All zones
racemosa**	California Sycamore	C/I/M
Podocarpus gracilior	Fern Pine	
Populus		
alba	White Poplar	D/M
fremontii**	Western Cottonwood	I
trichocarpa	Black Cottonwood	I/M
Prunus		
xblireiana	Flowering Plum	M
caroliniana	Carolina Laurel Cherry	C
ilicifolia**	Hollyleaf Cherry	C
lyonii**	Catalina Cherry	C
serrulata ‘Kwanzan’	Flowering Cherry	M
yedoensis ‘Akebono’	Akebono Flowering Cherry	M
Quercus		
agrifolia**	Coast Live Oak	C/I

BOTANICAL NAME	COMMON NAME	Climate Zone
engelmannii	Engelmann Oak	I
** suber	Cork Oak	C/I/D
Rhus		
lancea**	African Sumac	C/I/D
Salix spp.**	Willow	All zones (R)
Sapium		
sebiferum	Chinese Tallow Tree	
Stenocarpus		
sinuatus	Firewheel Tree	
Tipuana tipu	Tipu Trees	
Tristania conferta	Brisbane Box	C/I
Ulmus		
parvifolia	Chinese Elm	I/D
pumila	Siberian Elm	C/M
Umbellularia californica**	California Bay Laurel	C/I

BOTANICAL NAME	COMMON NAME	Climate Zone
SHRUBS		
Aloe species	Aloe	
Agapanthus africanus	Lily-of-the-Nile	
Agave		
americana	Century Plant	D
attenuata	Century Plant	D
deserti	Century Plant	
shawi**	Shawis Century Plant	D
Amorpha fruticosa**	False Indigobush	I
Arbutus		
menziesii**	Madrone	C/I
Arctostaphylos spp.**	Manzanita	C/I/D
Archtostapylos	Emerald Carpet Manzanita	
Emerald Carpet	Mugwort	
Artemisia douglasiana		
Atriplex**		
canescens	Hoary Saltbush	I
lentiformis	Quail Saltbush	D
Baccharis**		
glutinosa	Mule Fat	C/I
pilularis	Coyote Bush	C/I/D
Bougainvillea spp.	Bougainvillea	

BOTANICAL NAME	COMMON NAME	Climate Zone
Buxus microphylla 'Green Beauty'	Dwarf Boxwood	
Carissa grandiflora	Natal Plum	C/I
Carissa macrocarpa Green Carpet	Prostrate Natal Plum	
Ceanothus spp.**	California Lilac	C/I/M
Cistus spp.	Rockrose	C/I/D
Cneoridium dumosum**	Bushrue	C
Comarostaphylis** diversifolia	Summer Holly	C
Convolvulus cneorum	Bush Morning Glory	C/I/M
Cotoneaster lacteus	Parnys Red Clusterberry	
Dalea orcuttii	Orcutt's Delea	D
Dalea spinosa**	Smoke Tree	I/D
Dianela spp.	Flax Lily	
Dietes bicolor	Fortnight Lily	
Disctus Rivers	Royal Trumpet Vine	
Distictus buccinat oria	Blood-Red Trumpet Vine	
Echium fastuosum	Pride of Madeira	C/I/M
Elaeagnus pungens	Silverberry	C/I
Encelia** californica	Coast Sunflower	D/I
Encelia** farinose	White Brittlebush	
Epilobium californicum	California Fushcia	
Eriobotrya deflexa	Bronze Loquat	C/I
Eriophyllum confertiflorum**	Golden Yarrow	C/I C
Eriophyllum staechadifolium	Lizard Tail	C/I
Escallonia spp.	Escallonia	C/I/D
Feijoa sellowiana	Pineapple Guava	

BOTANICAL NAME	COMMON NAME	Climate Zone
Euryops pectinatus	Shrub Daisy	D
Fouqueria splendens	Ocotillo	I/M
Fremontodendron**		
californicum	Flannelbush	I
mexicanum	Southern Flannelbush	
Galvezia		C
juncea	Baja Bush-Snapdragon	C
speciosa	Island Bush-Snapdragon	
Garrya		C/I
elliptica	Coast Silktassel	I/M
flavescens**	Ashy Silktassel	
Heteromeles arbutifolia**	Ashy Silktassel	I/M
	Toyon	C/I/M
Isocoma menziesii	Goldenbush	
Lantana spp.	Lantana	C/I/D
Lotus scoparius	Deerweed	C/I
Mahonia spp.	Barberry	C/I/M
Malacothamnus clementinus	San Clemente Island Bush Mallow	C
fasciculatus**	Mesa Bushmallow	C/I
Melaleuca spp.	Melaleuca	C/I/D
Mimulus aurianticus	Pink Wisp Grass	
Mimulus spp.**	Monkeyflower	C/I (R)
Muhlenbergia caillaris	Pacifica Saltbush	
Myoporum pacificum	No Common Name	
Myoporum parvifolium	Myrtle	
Putah Creek Myrtus species	Heavenly Bamboo	
Nandina domestica		
Nolina	Parry's Nolina	
parryi	Wolf's Bear Grass	I
parryi ssp. wolfii	Rye Puffs	D
Pennisetum spatheolatum		

BOTANICAL NAME	COMMON NAME	Climate Zone
	Flax	
Phormium species	Photinia	
Photinia spp.		All Zones
Pittosporum	Karo	
crassifolium	Queensland Pittosporum	CI/I
rhombifolium	Wheeler's Dwarf	C/I
tobira 'Wheeleri'	Victorian Box	C/I/D
undulatum	Cape Pittosporum	C/I
viridiflorum	Cape Plumbago	C/I
Plumbago auriculata		C/I/D
Prunus	Carolina Laurel Cherry	
caroliniana	Hollyleaf Cherry	C
ilicifolia**	Catalina Cherry	C
lyonii**	Pomegranate Firethorn	C
Puncia granatum		C/I/D
Pyracantha spp.	Scrub Oak	All Zones
Quercus		
dumosa**	Italian Blackthorn	C/I
Rhamus	Coffeeberry	
alaternus	Rhaphiolepis	C/I
californica**	India Hawthorn	C/I/M
Rhaphiolepis spp.		C/I/D
Rhaphiolepis indica	Lemonade Berry	
	Pink-Flowering Sumac	
Rhus	Sugarbush squawbush	
integrifolia**		C/I
laurina lentii	Evergreen Currant	C/D
ovata**	Fuschia-Flowering Gooseberry	I/M I
trilobata**	Matilija Poppy	
Ribes		C/I
viburnifolium	California Wild Rose	C/I/D
speciosum**	Baja California Wild Rose	I
Romneya coulteri		
Rosa		C/I
californica**		C/I
minutifolia		
Salvia spp.**		
Salvia mellifera	Honey Sage	
Sambucus spp.**		
Strelitzia nicolia	Giant Bird of Paradise	
Strelitzia reginae	Bird of Paradise	
Symphoricarpos mollis**	Sage	All Zones
Syringa vulgaris	Elderberry	C/I/M
Tecomaria capensis	Creeping Snowberry	C/I

BOTANICAL NAME	COMMON NAME	Climate Zone
Teucrium fruticans	Lilac	M
~~Toxicodendron**~~Tecomaria capensis	Cape Honeysuckle	
~~diversilobum~~ Teucrium fruticans	Bush Germander	C/I/D
Trachelospermum jasminoides	Star Jasmine	C/I
Trachycarpus fortunei	Windmill Palm	
Verbena species	Verbena	
Verbena lilacina	Lilac Verbena	
Xylosma congestum	Shiny Xylosma	I/M
Yucca**		C
schidigera	Mojave Yucca	C/I
whipplei	Foothill Yucca	
Zamia furfuraccea	Cardboard Palm	D I

BOTANICAL NAME	COMMON NAME	Climate Zone
GROUNDCOVERS		
Achillea**	Yarrow	All Zones
Agapanthus Rancho White	White Lily-of-the-Nile	
Aptenia cordifolia	Apteria	C
Arctostaphylos spp.**	Manzanita	C/I/D
Baccharis**		
pilularis	Coyote Bush	C/I/D
Carex spp.	Sedge	
Ceanothus spp.**	California Lilac	C/I/M
Cerastium tomentosum	Snow-in-Summer	All Zones
Coprosma kirkii	Creeping Coprosma	C/I/D
Cotoneaster spp.	Redberry	All Zones
Cotoneaster dammeri Lowfast	Bearberry Cotoneaster	
Dichelostemma capitatum	Wild-Hyacinth	
Distichlis spicata	Salt Grass	
Drosanthemum hispidum	Rosea Ice Plant	C/I
Dudleya brittonii	Brittonis Chalk Dudleya	C

BOTANICAL NAME	COMMON NAME	Climate Zone
edulis	Lady's Fingers	
pulverulenta**	Chalk Dudleya	C/I
virens	Island Live Fore-ever	C
Eschscholzia californica**	California Poppy	All Zones
Euonymus fortunei		
'Carrierei'	Glossy Winter Creeper	M
'Coloratus'	Purple-Leaf Winter Creeper	M
Ferocactus viridescens**	Coast Barrel Cactus	C
Gaillardia grandiflora	Blanket Flower	All Zones
Gazania spp.	Gazania	C/I
Helianthemum spp.**	Sunrose	All Zones
Lantana spp.	Lantana	
Lasthenia		C/I/D
californica**	Common Goldfields	I
glabrata	Coastal Goldfields	C
Lavandula angustifolia	English Lavender	
Layia platyglossa	Tips Miniature	
Lupinus spp.**	Lupine	C/I/M
Marathon 2e	Dwarf Tall Fescue	
Paspalum vaginatum 'Aloha'	Seashore Paspalum	
Myoporum spp.	Myoporum	C/I
Nassella pulchra	Needle Grass	
Pyracantha spp.	Firethorn	All zones
Rosmarinus officinalis	Rosemary	C/I/D
Santolina		
chamaecyparissus	Lavender Cotton	All Zones
virens	Santolina	All Zones
Trifolium frageriferum	O'Connor's Legume	C/I
Verbena		
rigida	Verbena	All Zones
Viguiera laciniata**	San Diego Sunflower	C/I
Vinca		
minor	Dwarf Periwinkle	M

BOTANICAL NAME	COMMON NAME	Climate Zone
VINES		
Antigonon leptopus	San Miguel Coral Vine	C/I
Distictis buccinatoria	Blood-Red Trumpet Vine	C/I/D
Keckiella cordifolia**	Heart-Leaved Penstemon	C/I
Lonicera		
japonica 'Halliana'	Hall's Honeysuckle	All Zones
subspicata**	Chaparral Honeysuckle	C/I
Solanum		
jasminoides	Potato Vine	C/I/D

BOTANICAL NAME	COMMON NAME	Climate Zone
PERENNIALS		
Coreopsis	Giant Coreopsis	C
gigantean	Coreopsis	All Zones
grandiflora	Sea Dahlia	C
maritime	Coreopsis	C/I
verticillata	Island Coral Bells	C/I
Heuchera maxima	Douglas Iris	C/M
Iris douglasiana**	Poverty Weed	C/I
Iva hayesiana**	Red-Hot Poker	C/M
Kniphofia uvaria	Lavender	All Zones
Lavandula spp.		
Limonium californicum	Coastal Statice	C
var. mexicanum	Sea Lavender	C/I
perezii	Primrose	C/I/M
Oenothera spp.	Penstemon	C/I/D
Penstemon spp.**	Yerba Buena	C/I
Satureja douglasii		
Sisyrinchium	Blue-Eyed Grass	C/I
bellum	Golden-Eyed Grass	C
californicum		
Solanum		
xantii	Purple Nightshade	C/I
Zauschneria**		
californica	California Fuschia Hoary	C/I
cana	California Fuschia	C/I
'Catalina'	Catalina Fuschia	C/I

BOTANICAL NAME	COMMON NAME	Climate Zone
ANNUALS		
Lupinus spp.**	Lupine	C/I/M

APPENDIX I

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.

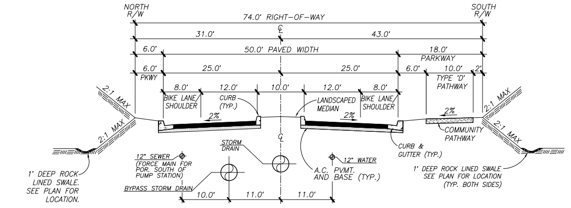
www.bewaterwise.com. 2004. Fire-resistant California Friendly Plants.

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.

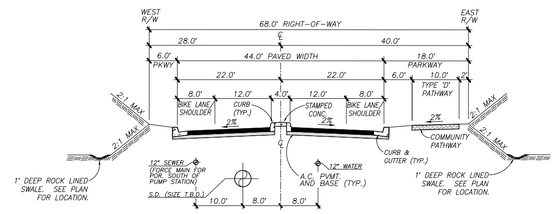
APPENDIX J

Road and Street Classifications and Cross Sections



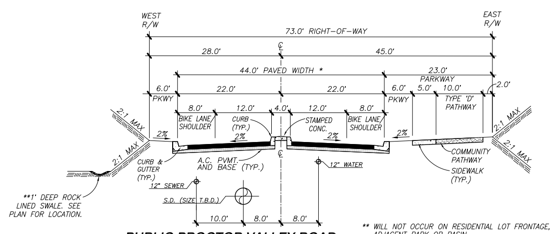
1 **PUBLIC PROCTOR VALLEY ROAD / CITY OF CHULA VISTA**
CLASS II COLLECTOR (CCV) — NTS

NO PARKING PERMITTED WITHIN BIKE LANE / SHOULDER
40 MPH DESIGN SPEED
WAIVERS:
- MODIFICATIONS TO PARKWAYS AS SHOWN
- MEDIAN REDUCED TO 4'
- RIGHT OF WAY REDUCED FROM 78' TO 68'



2 **PUBLIC PROCTOR VALLEY ROAD**
MODIFIED LIGHT COLLECTOR (2.2A) — NTS

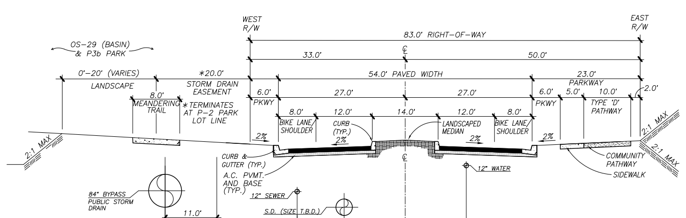
NO PARKING PERMITTED
40 MPH DESIGN SPEED
WAIVERS:
- MODIFICATIONS TO PARKWAYS AS SHOWN
- MEDIAN REDUCED TO 4'
- RIGHT OF WAY REDUCED FROM 78' TO 68'



** WILL NOT OCCUR ON RESIDENTIAL LOT FRONTAGE, ADJACENT PARK OR BASIN

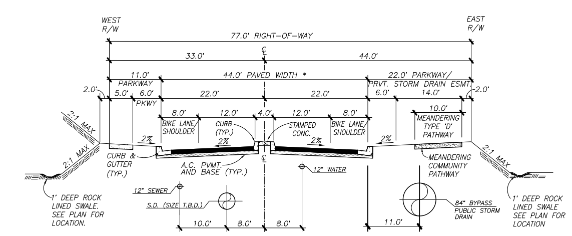
3 **PUBLIC PROCTOR VALLEY ROAD**
MODIFIED LIGHT COLLECTOR (2.2A) — NTS

NO PARKING PERMITTED
30 MPH DESIGN SPEED / 20 MPH AT ROUNDABOUT
WAIVERS:
- MODIFICATIONS TO PARKWAYS AS SHOWN
- MEDIAN REDUCED TO 4'
- REDUCE DESIGN SPEED FROM 40 MPH TO 30 MPH (20 MPH)
- RIGHT OF WAY REDUCED FROM 78' TO 73'



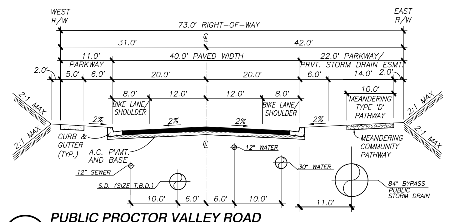
4 **PUBLIC PROCTOR VALLEY ROAD**
MODIFIED LIGHT COLLECTOR (2.2A) — NTS

NO PARKING PERMITTED
30 MPH DESIGN SPEED / 20 MPH AT ROUNDABOUT
WAIVERS:
- MODIFICATIONS TO PARKWAYS AS SHOWN
- REDUCE DESIGN SPEED FROM 40 MPH TO 30 MPH (20 MPH)



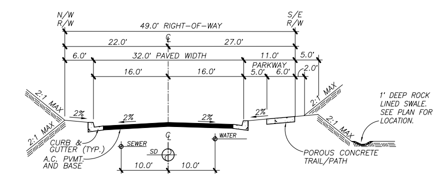
5 **PUBLIC PROCTOR VALLEY ROAD**
MODIFIED LIGHT COLLECTOR (2.2A) — NTS

NO PARKING PERMITTED
30 MPH DESIGN SPEED / 20 MPH AT ROUNDABOUT
WAIVERS:
- MODIFICATIONS TO PARKWAYS AS SHOWN
- MEDIAN REDUCED TO 4'
- REDUCE DESIGN SPEED FROM 40 MPH TO 30 MPH (20 MPH)
- RIGHT OF WAY REDUCED FROM 78' TO 77'



6 **PUBLIC PROCTOR VALLEY ROAD**
MODIFIED LIGHT COLLECTOR (2.2E) — NTS

NO PARKING PERMITTED
30 MPH DESIGN SPEED / 20 MPH AT ROUNDABOUT)
WAIVERS:
- MODIFICATIONS TO PARKWAYS AS SHOWN
- REDUCE DESIGN SPEED FROM 40 MPH TO 30 MPH (20 MPH)

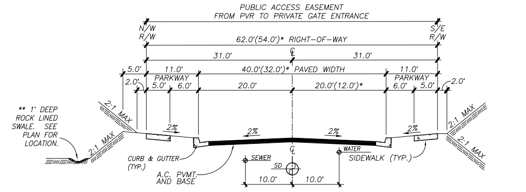


7 **PRIVATED MODIFIED RESIDENTIAL COLLECTOR** — NTS

NO PARKING PERMITTED
25 MPH DESIGN SPEED

CENTRAL VILLAGE: ST 'Y', (FROM PVR TO ST 'T'),

WAIVERS:
- REDUCE DESIGN SPEED FROM 30 MPH TO 25 MPH
- DUE TO STEEP TERRAIN AND AN EFFORT TO MINIMIZE IMPACTS TO THE SURROUNDING MSCP PRESERVE, A MINIMUM INTERSECTION SPACING OF 150' IS REQUESTED IN LIEU OF 200'.
- REDUCE MINIMUM HORIZONTAL CURVE RADIUS FROM 300' TO 200'
- MODIFICATIONS TO PARKWAY AS SHOWN

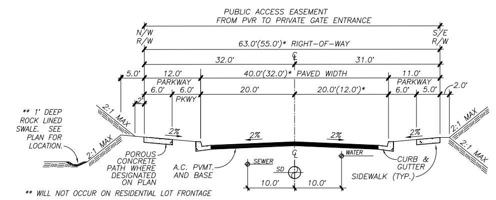


** WILL NOT OCCUR ON RESIDENTIAL LOT FRONTAGE

8 **PRIVATE MODIFIED RESIDENTIAL COLLECTOR** — NTS

PARKING PERMITTED ON BOTH SIDES OF STREET
25 MPH DESIGN SPEED
WAIVERS:
- REDUCE DESIGN SPEED FROM 30 MPH TO 25 MPH
- DUE TO STEEP TERRAIN AND AN EFFORT TO MINIMIZE IMPACTS TO THE SURROUNDING MSCP PRESERVE, A MINIMUM INTERSECTION SPACING OF 150' IS REQUESTED IN LIEU OF 200'.
- REDUCE MINIMUM HORIZONTAL CURVE RADIUS FROM 300' TO 200'
- MODIFICATIONS TO PARKWAY AS SHOWN
* PARKING CAN BE ELIMINATED ON ONE SIDE IF STREET IS NON-LOADED. SEE PLAN FOR LOCATIONS.

CENTRAL VILLAGE: ST 'R', ST 'S' (FROM ST 'R' TO ST 'U'),
ST 'Z1' (FROM ST 'ZZ' TO ST 'Y'),
ST 'GG' (FROM PP-3 TO PVR)
AND ST 'RR' (FROM PP-4 TO PVR)
NORTH VILLAGE: ST 'UU' (FROM PPP-9 TO ST PVR)
AND ST 'YY' (FROM ST 'VV' TO PVR)



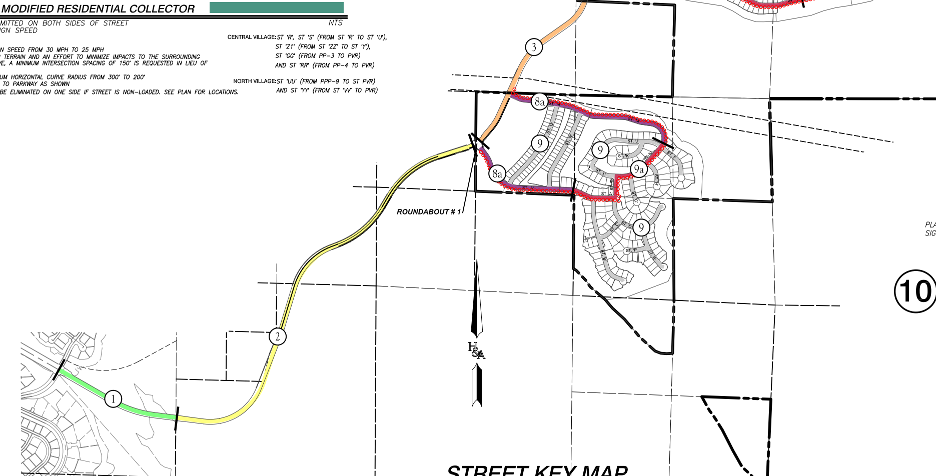
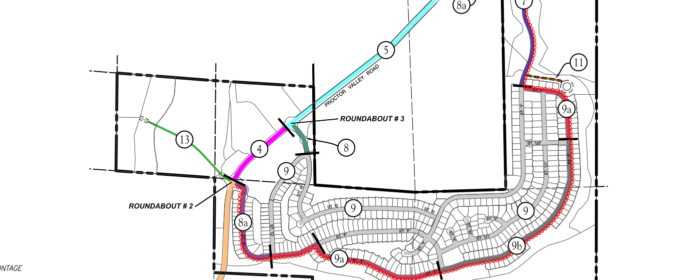
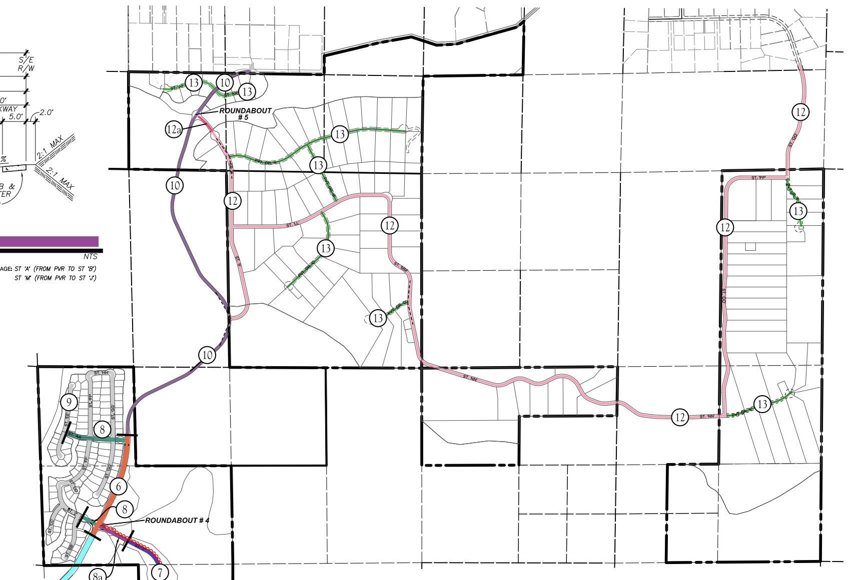
** WILL NOT OCCUR ON RESIDENTIAL LOT FRONTAGE

8a **PRIVATE MODIFIED RESIDENTIAL COLLECTOR** — NTS

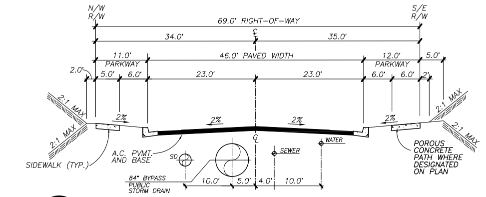
PARKING PERMITTED ON BOTH SIDES OF STREET
25 MPH DESIGN SPEED

SOUTH VILLAGE: ST 'A' (FROM PVR TO ST 'B')
ST 'M' (FROM PVR TO ST 'J')

WAIVERS:
- REDUCE DESIGN SPEED FROM 30 MPH TO 25 MPH
- DUE TO STEEP TERRAIN AND AN EFFORT TO MINIMIZE IMPACTS TO THE SURROUNDING MSCP PRESERVE, A MINIMUM INTERSECTION SPACING OF 150' IS REQUESTED IN LIEU OF 200'.
- REDUCE MINIMUM HORIZONTAL CURVE RADIUS FROM 300' TO 200'
- MODIFICATIONS TO PARKWAY AS SHOWN
* PARKING CAN BE ELIMINATED ON ONE SIDE IF STREET IS NON-LOADED. SEE PLAN FOR LOCATIONS.

STREET KEY MAP
NOT TO SCALE
POROUS CONCRETE TRAIL/PATH

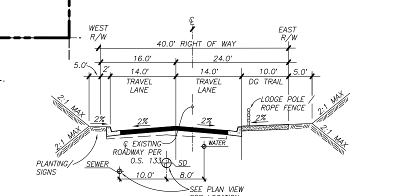


9b **PRIVATE MODIFIED RESIDENTIAL ROAD** — NTS

PARKING PERMITTED ON BOTH SIDES OF STREET
25 MPH DESIGN SPEED

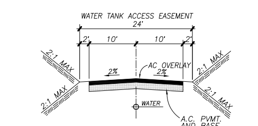
CENTRAL VILLAGE: ST 'R' (FROM ST 'P' TO ST 'U2')

WAIVERS:
- REDUCE DESIGN SPEED FROM 30 MPH TO 25 MPH
- MODIFICATIONS TO PARKWAY AS SHOWN



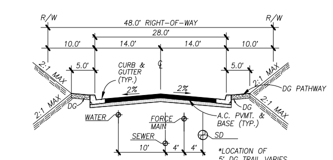
10 **PUBLIC PROCTOR VALLEY ROAD**
MODIFIED LIGHT COLLECTOR (2.2F) — NTS

NO PARKING PERMITTED
40 MPH DESIGN SPEED



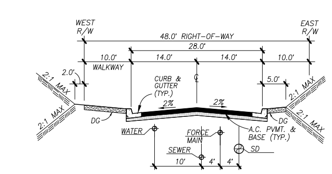
11 **COUNTY PUBLIC ACCESS ROAD/**
WATER LINE MAINTENANCE ROAD — NTS

NO PARKING PERMITTED
25 MPH DESIGN SPEED



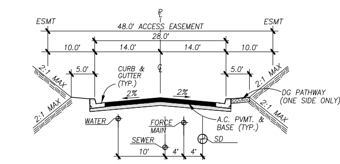
12 **PUBLIC RURAL RESIDENTIAL ROAD** — NTS

NO PARKING PERMITTED
25 MPH DESIGN SPEED
- REDUCE DESIGN SPEED FROM 30 MPH TO 25 MPH



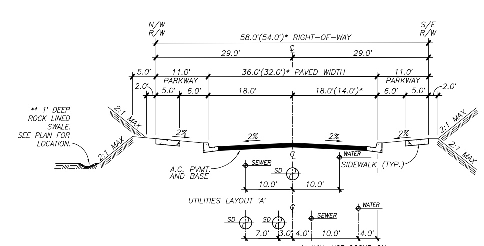
12a **PUBLIC RURAL RESIDENTIAL ROAD** — NTS

NO PARKING PERMITTED
25 MPH DESIGN SPEED
- REDUCE DESIGN SPEED FROM 30 MPH TO 25 MPH



13 **PRIVATE RURAL RESIDENTIAL ROAD** — NTS

NO PARKING PERMITTED
25 MPH DESIGN SPEED

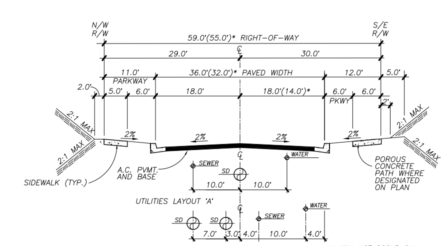


** WILL NOT OCCUR ON RESIDENTIAL LOT FRONTAGE

9 **PRIVATE MODIFIED RESIDENTIAL ROAD** — NTS

PARKING PERMITTED ON BOTH SIDES OF STREET
25 MPH DESIGN SPEED
WAIVERS:
- REDUCE DESIGN SPEED FROM 30 MPH TO 25 MPH
- DUE TO STEEP TERRAIN AND AN EFFORT TO MINIMIZE IMPACTS TO THE SURROUNDING MSCP PRESERVE, A MINIMUM INTERSECTION SPACING OF 150' IS REQUESTED IN LIEU OF 200'.
- MODIFICATIONS TO PARKWAY AS SHOWN
- REDUCE MINIMUM HORIZONTAL CURVE RADIUS FROM 200' TO 160'
* PARKING CAN BE ELIMINATED ON ONE SIDE IF STREET IS NON-LOADED. SEE PLAN FOR LOCATIONS.

SOUTH VILLAGE: ST 'D' (FROM ST 'A' TO CUL DE SAC), ST 'B', ST 'C', ST 'E', ST 'F', ST 'G', ST 'H', ST 'I', ST 'J', ST 'K', ST 'L' (FROM ST 'D' TO ST 'J'), ST 'N' & ST 'O'
CENTRAL VILLAGE: ST 'Q', ST 'R' (FROM ST 'Q' TO 'S'), ST 'S', ST 'U1', ST 'U2', ST 'V', ST 'W', ST 'X', ST 'Y' (FROM LOT 4 TO ST 'T')
NORTH VILLAGE: ST 'Z' (FROM ST 'BB' TO LOT 22) ST 'AA' (FROM ST 'EE' TO ST 'FF') ST 'BB', ST 'CC', ST 'DD', ST 'EE' ST 'FF', ST 'GG' & ST 'HH'



** WILL NOT OCCUR ON RESIDENTIAL LOT FRONTAGE

9a **PRIVATE MODIFIED RESIDENTIAL ROAD** — NTS

PARKING PERMITTED ON BOTH SIDES OF STREET
25 MPH DESIGN SPEED
WAIVERS:
- REDUCE DESIGN SPEED FROM 30 MPH TO 25 MPH
- DUE TO STEEP TERRAIN AND AN EFFORT TO MINIMIZE IMPACTS TO THE SURROUNDING MSCP PRESERVE, A MINIMUM INTERSECTION SPACING OF 150' IS REQUESTED IN LIEU OF 200'.
- MODIFICATIONS TO PARKWAY AS SHOWN
- REDUCE MINIMUM HORIZONTAL CURVE RADIUS FROM 200' TO 160'
* PARKING CAN BE ELIMINATED ON ONE SIDE IF STREET IS NON-LOADED. SEE PLAN FOR LOCATIONS.

SOUTH VILLAGE: ST 'A' (FROM ST 'B' TO ST 'D'), ST 'D' (FROM ST 'A' TO ST 'L'), ST 'L' (FROM ST 'D' TO ST 'I'/'J')
CENTRAL VILLAGE: ST 'P' (FROM ST 'Q' TO ST 'T') ST 'T' (FROM ST 'P' TO ST 'P' & ST 'U2' TO ST 'Y')

PDS2016-SP-16-002 / PDS2016-GPA-16-008 / PDS2016-REZ-16-006 / PDS2016-TM-5616 / PDS2016-STP-16-027

SOURCE: HUNSAKER AND ASSOCIATES, INC. 2017

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APPENDIX J
Road Classification and Street Cross Sections

Otay Ranch Village 14 and Planning Areas 16/19

APPENDIX K

Ignition-Resistant Construction Requirements

APPENDIX K
Ignition Resistant Construction Requirements

As of the date of this fire protection plan, the following are the requirements for ignition resistant construction for The Proposed Project, including requirements under Chapter 7A of the California Building Code (CBC). In addition, exterior building construction including roofs, eaves, exterior walls, doors, windows, decks, and other attachments must meet the most current CBC Chapter 7A ignition resistance requirements at the time of building permit application.

1. All structures will be built with a Class A roof assembly, including a Class A roof covering. Roofs shall have a roofing assembly installed in accordance with its listing and the manufacturer's installation instructions.
2. Where the roof profile allows a space between the roof covering and roof decking, the spaces shall be constructed to prevent the intrusion of flames and embers, be fire stopped with approved materials or have one layer of minimum 72 pound mineral-surfaced non-perforated cap sheet complying with ASTM D 3909 installed over the combustible decking. However, openings on barrel tiles or similar roof coverings, must be fire stopped (bird stopped) with approved materials to prevent the accumulation of debris, bird nests, etc. between the tiles and decking material.
3. When provided, exposed valley flashings shall be not less than 0.019-inch (No. 26 galvanized sheet gage) corrosion-resistant metal installed over a minimum 36-inch-wide underlayment consisting of one layer of minimum 72 pound mineral-surfaced non-perforated cap sheet complying with ASTM D 3909 running the full length of the valley.
4. All rain gutters, down spouts and gutter hardware shall be constructed from metal or other non-combustible material to prevent wildfire ignition along eave assemblies.
5. All chimney, flue or stovepipe openings attached to a fireplace, stove, or other solid or liquid fuel burning equipment or device shall be equipped with an approved spark arrester. An approved spark arrester is defined as a device intended to prevent sparks from escaping into the atmosphere and constructed of nonflammable materials, having a 12-gauge minimum thicknesses with openings no greater than ½ inch, or other alternative material the Fontana Fire Protection District determines to provide equal or better protection. It shall be installed to be visible for the purposes of inspection and maintenance.
6. The exterior surface materials shall be non-combustible, including hard or ignition resistant, such as stucco. In all construction, exterior walls shall extend from the top of the foundation to the roof and terminate at 2-inch nominal solid blocking between rafters at all roof overhangs, or in the case of enclosed eaves, terminate at the enclosure.
7. All eaves, fascias, and soffits will be enclosed (boxed) with non-combustible materials. This shall apply to the entire perimeter of each structure. Eaves of heavy timber construction are not required to be enclosed as long as attic venting is not installed in the

eaves. For the purposes of this section, heavy timber construction shall consist of a minimum of 4"x 6" rafter tails.

8. Paper-faced insulation shall be prohibited in attics or ventilated spaces.
9. Automatic interior fire sprinklers for single-family residences shall be installed according to the National Fire Protection Association (NFPA) 13D 2013 edition - *Standard for the Installation of Sprinkler Systems in One and Two-family Homes and Manufactured Homes*.
10. Roof vents, dormer vents, gable vents, foundation ventilation openings, ventilation openings in vertical walls, or other similar ventilation openings shall be louvered and covered with 1/8-inch, noncombustible, corrosion-resistant metal mesh or other approved material that offers equivalent protection. Turbine attic vents shall be prohibited.
    - ≠ Specialized vents with baffle systems or other methods to catch burning embers, such as Brandguard (www.brandguardvents.com) or approved equivalent shall be considered by the San Diego County Fire Authority and Building Official for all structure vents on all homes/garages in the Proposed Project.
11. Attic or foundation ventilation louvers or ventilation openings in vertical walls shall not exceed 144 square inches per opening and shall be covered with 1/8" inch mesh corrosion-resistant metal screen or other approved material that offers equivalent protection. Ventilation louvers and openings may be incorporated as part of access assemblies.
12. No attic ventilation openings or ventilation louvers shall be permitted in soffits, in eave overhangs, between rafters at eaves, or in other overhanging areas.
13. All fences and gate assemblies (fences, gates, and fence posts) attached or within five feet of a structure shall be of non-combustible material or pressure-treated exterior fire-retardant wood.
14. All projections (exterior balconies, decks, patio covers, unenclosed roofs and floors, and similar architectural appendages and projections) or structures less than five feet from a building shall be of non-combustible material, one-hour fire resistive construction on the underside, heavy timber construction, pressure-treated exterior fire- retardant wood or ignition resistant construction. When such appendages and projections are attached to exterior fire- resistive walls, they shall be constructed to maintain same fire-resistant standards as the exterior walls of the structure.
15. Accessory structures attached to buildings with habitable spaces and projections shall be in accordance with Chapter 7A of the CBC.

16. Detached accessory structures located less than 50 feet from a building containing habitable space shall be constructed in accordance with Chapter 7A of the CBC.

    ≠ ***Exception:*** *Accessory structures less than 120 square feet in floor area located at least 30 feet from a building containing a habitable space.*

17. Exterior doors shall be approved non-combustible construction, solid core wood and shall conform to the performance requirements of standard SFM 12-7A-1 or shall be of approved noncombustible construction, or solid core wood having stiles and rails not less than 1⅜ inches thick with interior field panel thickness no less than 1¼ inches thick, or shall have a fire-resistance rating of not less than 20 minutes when tested according to National Fire Protection Association (NFPA) 252.

18. All glass or other transparent, translucent or opaque glazing materials, that is used in exterior windows, including skylights, or exterior glazed door assemblies shall be constructed of multipane glazing with one tempered pane meeting the requirements of Section 2406 (2013 CBC) Safety Glazing. .

19. Vinyl window assemblies are deemed acceptable if the windows have the following characteristics:

    ≠ Frame and sash are comprised of vinyl material with welded corners

    ≠ Metal reinforcements in the interlock area

    ≠ Glazed with insulating glass, annealed or tempered (one layer of which must be tempered glass).

    ≠ Frame and sash profiles are certified in AAMA Lineal Certification Program.

    ≠ Certified and labeled to ANSI/AAMA/NWWDA 101/LS2-97 for Structural Requirements.

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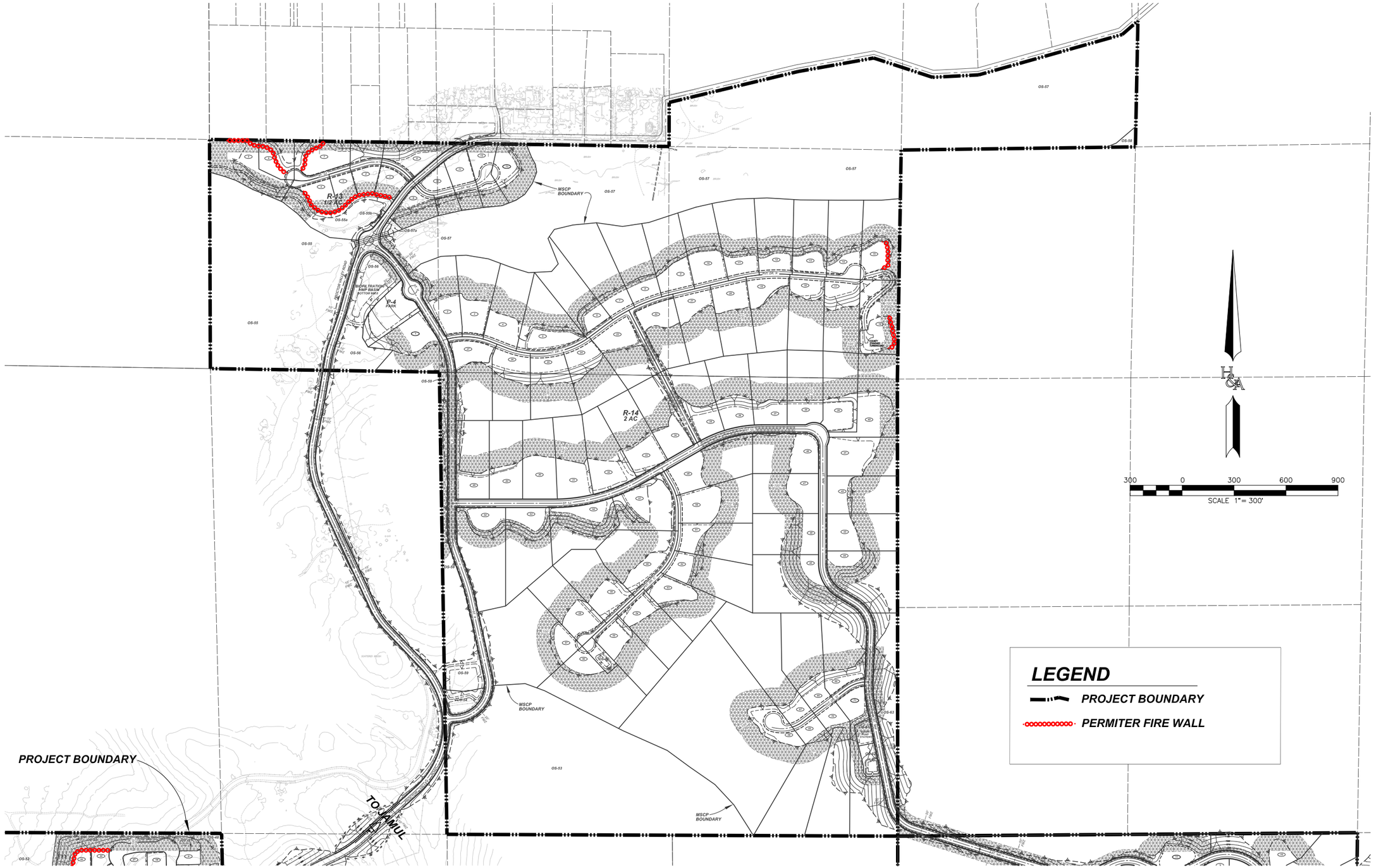
APPENDIX L

Fire Wall Exhibits



SOURCE: HUNSAKER AND ASSOCIATES, INC. 2017

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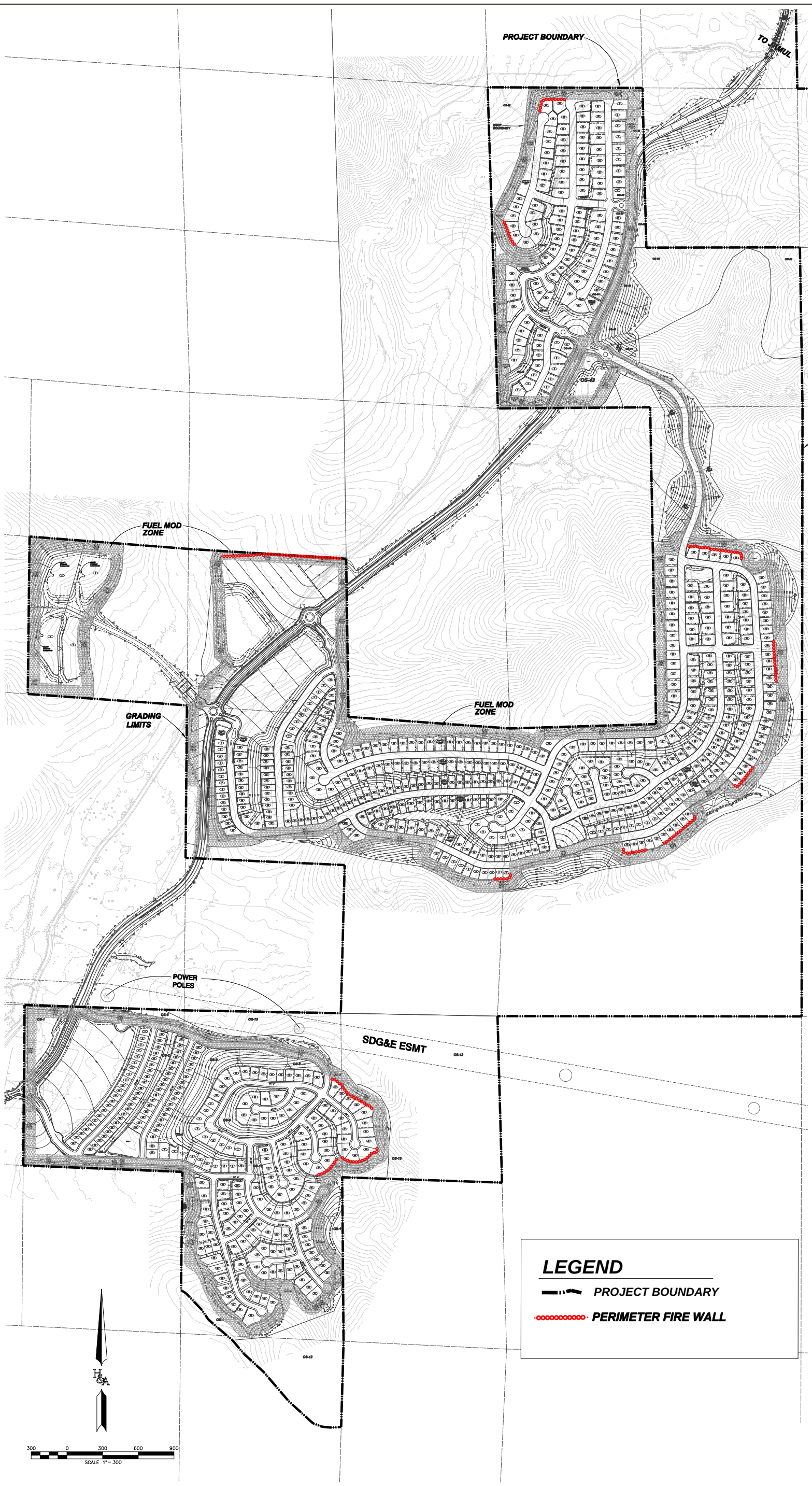
APPENDIX L-1

Planning Areas 16/19 Perimeter Fire Walls

Otay Ranch Village 14 and Planning Areas 16/19



SOURCE: HUNSAKER AND ASSOCIATES, INC. 2017

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APPENDIX L-2

Village 14 Perimeter Fire Walls