5.19 Wildfire

NOTE TO READER: The purpose of this section of the Partial Recirculated Draft EIR (RDEIR) is to identify, to the extent feasible, the potential for wildland fires in connection with the proposed Project site, to identify potential risks to human health including residents in existing homes and businesses surrounding the site, future residents of the proposed Project, as well as workers and construction workers, and to identify Shasta County (County) and state policies and regulations to reduce risk.

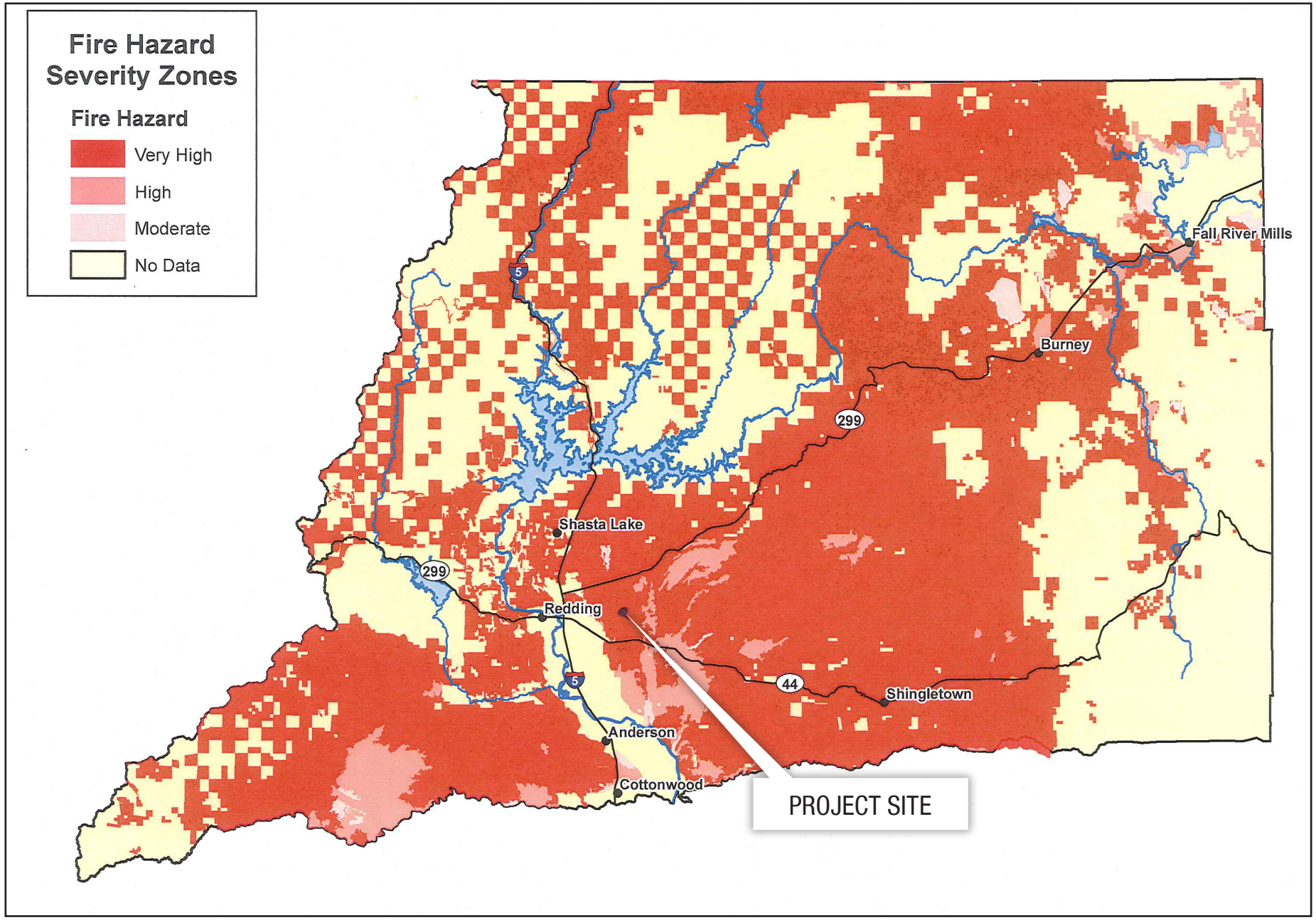
It should be noted potential impacts from wildfire were evaluated in Chapter 5.8, HAZARDS AND HAZARDOUS MATERIALS of the 2017 Draft EIR for the proposed Project. In 2018, subsequent to the release of the Draft EIR, the State CEQA Guidelines were updated. As part of that update, Appendix G was revised to include wildfire as a separate topic of discussion. As such, this section is included in this RDEIR. This section includes much of the wildfire discussion in analysis previously included in Section 5.8 of the Draft EIR as well as additional analysis consistent with the current Appendix G checklist in the State CEQA Guidelines.

The following analysis of the potential environmental impacts related to wildfire is primarily derived from the following sources:

- California Department of Forestry and Fire Protection. *State Responsibility Areas*. November 2007.
- Shasta County. *Shasta County General Plan*. September 2004.
- Shasta County. *Shasta County and City of Anderson Multi-Jurisdictional Hazard Mitigation Plan*. November 7, 2017.
- Wildland Resource Managers. *Tierra Robles Wildland Fuel/Vegetation Management Plan.* July 2015.
- Cornelius Nuworsoo, Ph.D., AICP. *Tierra Robles Area Evacuation Traffic Study*. January 2020 (included as Appendix RDEIR D-1)

5.19.1 Environmental Setting

The California Department of Forestry and Fire Protection (CAL FIRE) manages significant fire hazards in the state through its Fire and Resources Assessment Program (FRAP). These maps place areas of the state into different fire hazard severity zones (FHSZ) based on a hazard scoring system using subjective criteria for fuels, fire history, terrain influences, housing density, and occurrence of severe fire weather where urban conflagration could result in catastrophic losses. As part of this mapping system, land where CAL FIRE is responsible for wildland fire protection and generally located in unincorporated areas is classified as a State Responsibility Area (SRA). As shown in FIGURE 5.19-1, FIRE HAZARD SEVERITY ZONES IN SRA, the Project site is located within a State Responsibility Area and the entire site is located within the Very High Fire Hazard Severity Zone.



N.T.S.

TIERRA ROBLES PLANNED DEVELOPMENT • RECIRCULATED EIR

Very High Fire Severity Zone

Figure 5.19-1

Fire protection services for the Project area are provided by the California Department of Forestry and Fire Protection (CAL FIRE), based in the Redding area. The Shasta County Fire Department (SCFD) contracts with CAL FIRE to manage and oversee the operation of SCFD. Both the SCFD/CAL FIRE maintain automatic and mutual aid agreements with adjacent fire districts, including the Redding Fire Department (RFD).

The proposed Project is within Battalion 4 (Redding). Battalion 4 is located on the valley floor and along the Interstate 5 and Sacramento River corridor, running north and south, between the borders of Siskiyou and Tehama counties. Battalion 4 is interspersed with three incorporated cities, which include the City of Redding, the City of Anderson, and the City of Shasta Lake. There are three unincorporated communities within the Battalion which are served by independent Fire Districts: Mountain Gate, Happy Valley, and Cottonwood. The northern portion of Battalion 4, north of Shasta Lake, lies within federal direct protection area and is administered by the United States Forest Service (USFS), Shasta -Trinity National Forest. While the statutory responsibility for all wildland fires on these lands rests with the USFS, the protection responsibility for all medical aids, traffic collisions, hazardous conditions, and fires - involving boats, automobiles, structures, and other improvements - is served by the SCFD, administered by CAL FIRE under cooperative agreement.

WILDLAND FIRES

Wildland fires are those that burn natural or wild vegetation located on undeveloped lands. In Shasta County, human activities are the causes of approximately 90% of wildland fires and lightning causes approximately 10%. Wildland fires present a major safety hazard to rural development located in forest, brush, and grass covered areas. The majority of wildland fires in the County occur in upland areas where fire hazards can be extreme due to an abundance of highly flammable vegetation and long, dry summers.

The County uses the California Department of Forestry and Fire Protection (CAL FIRE) fire hazard severity classification system for California's wildlands. This system assesses the fire potential for wildlands based on three factors: fuel load, climate, and topography. Each of these factors is discussed below.

Fuel Load- Vegetation is the major source of fire fuel. The quantity of available vegetative fuel determines the intensity of a wildland fire. Types of fuel loads are classified into three categories:

- *light (grass)*. areas dominated by grasses, annual herbs, and barren land. This is the lightest fuel load; it burns easily but is the easiest to control.

- *medium (shrub)*- areas in which brush, shrubs, and other perennial vegetation less than six feet in height are dominant.

- *heavy (woods brush wood*). areas in which vegetation six feet or more in height is dominant. This is the hardest vegetative type to start burning but, due to the heavy fuel load, it is the hardest to control once burning.

Other factors that strongly influence the potential for wildfires include climate/weather and topography. The combination of wind, low relative humidity, and seasonal lack of precipitation increases the potential for wildfire. The County climate is typified by long, dry, and hot summers. These conditions reduce the moisture in vegetation, thereby increasing its susceptibility to fire and once burning, wind can cause a fire to spread rapidly. In addition, topography such as areas with steep slopes can cause fires to burn faster and decrease mobility of emergency equipment. Thus, as slope increases, the ability to control fire decreases.

ONSITE WILDFIRE HAZARDS

A wildfire is an uncontrolled fire spreading through vegetative fuels, exposing and possibly consuming structures and may originate from a variety of ignition sources.[1] Three different types of wildfires exist. A "surface fire" is the most common type and burns along the floor of a forest, moving slowly and killing or damaging trees. A "ground fire" is usually started by lightning and burns on or below the forest floor in the organic layer down to the mineral soil. "Crown fires" spread rapidly by wind and move quickly by jumping along the tops of trees.

There are four principal vegetative communities on the proposed Project site: 1) annual grassland, 2) blue oak woodlands, 3) blue oak/interior live oak/gray pine and 4) interior live oak/shrub. The United States Department of Agriculture (USDA) developed fire behavior models based on fire danger ratings for each vegetative type. These vegetation communities and the applicable fire behavior model are shown on FIGURE 5.19-2, ONSITE FIRE BEHAVIOR FUEL MODEL AREAS, and are described below.

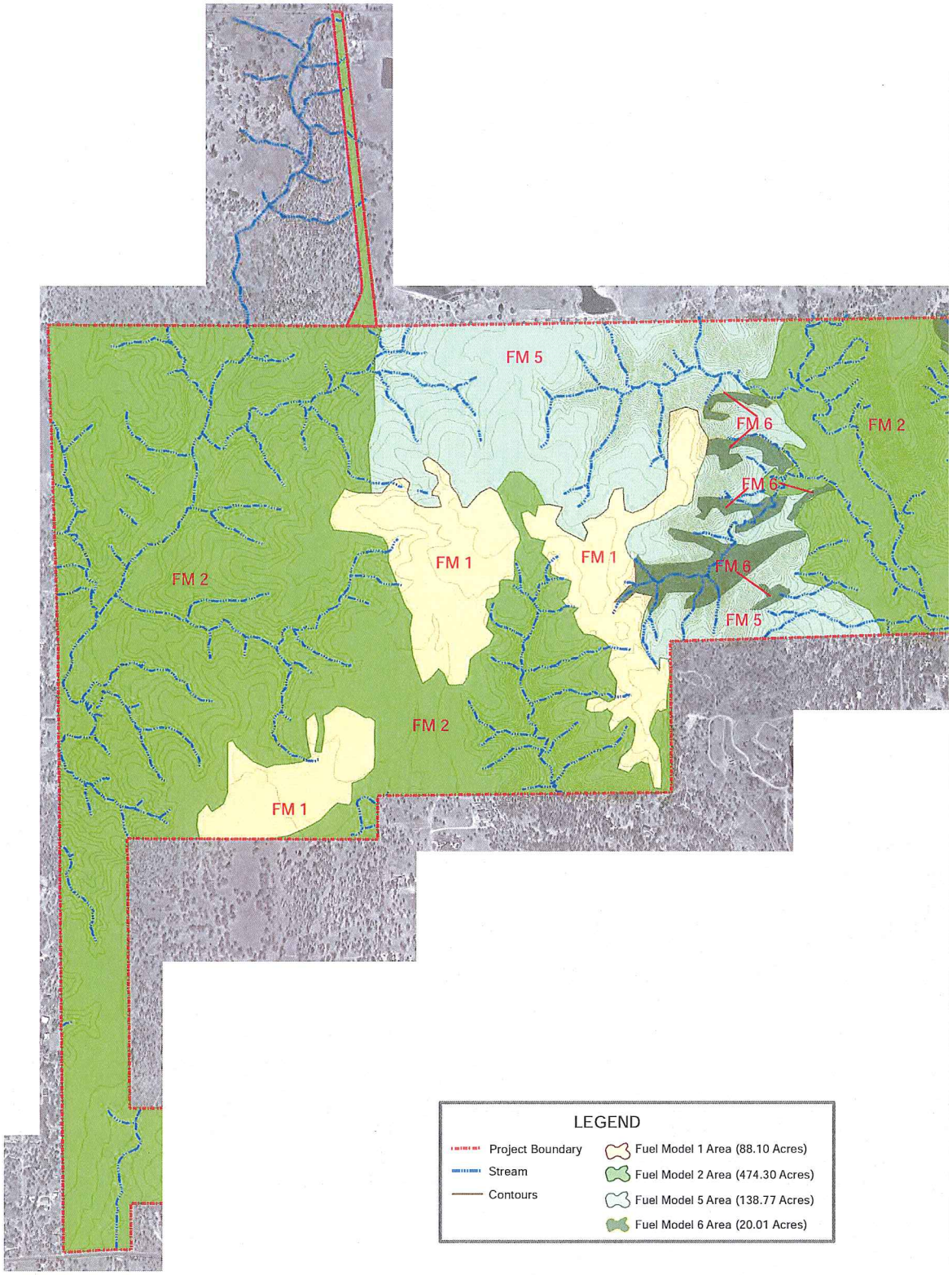
- *Annual Grasslands* – Fire Behavior Fuel Model 1. Fire spread is governed by the fine, very porous, and continuous herbaceous fuels that have cured or are nearly cured. Fires are surface fires that move rapidly through the cured grass and associated material. Very little shrub or timber is present, generally less than one-third of the area.

- *Blue Oak Woodlands* – Fire Behavior Fuel Model 2. Fire spread is primarily through the fine herbaceous fuels, either curing or dead. These are surface fires where the herbaceous material, in addition to litter and dead-down stem wood from the open shrub or timber overstory, contribute to the fire intensity. Open shrub lands and oak/pine stands that cover one-third to two-thirds of the area may generally fit this model. Such stands may include clumps of fuels that generate higher intensities and that may produce firebrands.

- *Blue Oak/Interior Live Oak/Gray Pine* – Fire Behavior Fuel Model 5. Fire is generally carried in the surface fuels that are made up of litter cast by the shrubs and the grasses or forbs in the understory. The fires are generally not very intense because surface fuels loads are light, the shrubs are young with little dead material, and the foliage contains little volatile material.

- *Interior Live Oak* - Fire Behavior Fuel Model 6. Fires carry through the shrub layer where the foliage is more flammable than fuel model 5, but this requires moderate winds, greater than 8 mi/h at mid-flame height. Fire will drop to the ground at low wind speeds or at openings in the stand. The shrubs are older

[1] *Shasta County Multi-Jurisdictional Hazard Mitigation Plan*, Section 4.3.2, page 4-28. 2011.



SOURCE: Wildland Resource Managers, Lehmann & Assoc. Consulting, S2-J2 Engineering

N.T.S.

On site Fire Behavior Fuel Model Areas

Figure 5.19-2

but not as tall as shrub types of model 4, nor do they contain as much fuel as model 4.

Late spring through mid-fall are known as the "fire season" in California due to the lack of moisture and dry fuel conditions. These factors coupled with the vegetation found on the Project site contribute to a high risk of fire.

SURROUNDING LAND USES

The proposed Project site is located within a primarily rural residential area, with parcels varying in size from 1 to 20 acres, and limited agricultural uses (refer to Table 5.19-1, EXISTING SURROUNDING LAND USES).

Table 5.19-1
EXISTING SURROUNDING LAND USES

Direction from Proposed Project Site	Existing Land Uses	Existing General Plan Designation	Existing Zoning Districts
North	Vacant, Rural Residential, Old Alturas Road / Seven Lakes Road	Rural Residential A (RA)	Exclusive Agriculture (EA), Unclassified (U)
East	Vacant, Rural Residential, Rustic Oak Lane, Adar Lane, Sparrow Lane, Cholet Way, Deschutes Road	Rural Residential A (RA)	Rural Residential 5-acre minimum (R-R-BA-5); Rural Residential 3-acre minimum (R-R-BA-3); Rural Residential 2.5-acre minimum (R-R-BA-2.5); Rural Residential with Mobile Home 3-acre minimum (R-R-T-BA-3); Rural Residential with Mobile Home 2.5-acre minimum (R-R-T-BA-2.5); Rural Residential with Mobile Home (R-R-T); Unclassified (U)
South	Vacant, Rural Residential, Boyle Road, Pebble Creek Lane, Northgate Drive, Petunia Lane, Cheshire Way	Rural Residential A (RA)	Rural Residential with Mobile Home (R-R-T), Rural Residential with Mobile Home 3-acre minimum (R-R-T-BA-3), Rural Residential 3-acre minimum (R-R-BA-3), Rural Residential with Mobile Home 2.5-acre minimum (R-R-T-BA-2.5), Unclassified (U)
West	Vacant, Rural Residential, Rae Lane, Oak Knoll Road, Falling Oaks Road, Old Alturas Road	Rural Residential A (RA)	Rural Residential with Mobile Home 3-acre minimum (R-R-T-BA-3); Rural Residential with Mobile Home (R-R-T); Unclassified (U)

Source: Shasta County. *Shasta County General Plan*; *Shasta County Zoning Plan*; Google Earth 2017.

5.19.2 Regulatory Setting

FEDERAL

There are no relevant federal regulations in regard to wildfires.

STATE

State General Plan Requirements

State law requires the legislative body of a city or county to adopt a comprehensive, long-term general plan that includes various elements, including a safety element for the protection of the community from unreasonable risks associated with among other things, wildland and urban fires. State responsibility areas (SRA), as defined in California Public Resources Code §4102, and very high fire hazard severity zones (VHFHSZ), as defined in California Government Code (CGC) §51177 & 51178, are required to be updated in

safety elements as necessary to address the risk of fire in these areas pursuant to CGC §65302(g)(3). The Project site is within an SRA and a VHFHSZ (CAL FIRE, 2007).

California Environmental Quality Act (CEQA)

CEQA, PRC §21000, et seq., was amended in 2018 to address numerous legislative changes to CEQA, to clarify certain portions of existing State CEQA Guidelines, and to update the State CEQA Guidelines to be consistent with recent court decisions.

Impacts of wildfire to development and a development's contribution to the potential creation of wildfire risk at the Wildland-Urban Interface (WUI) are now addressed as a separate "Environmental Factor" to be addressed in the Environmental Checklist Form in Appendix G of the State CEQA Guidelines. The Natural Resources Agency expanded the requirements of SB 1241 to also include development projects "near" SRA's and Very High FHSZs.

California Public Resources Code Section 4290

Regulations under California Public Resources Code Section 4290 (PRC 4290) have been prepared and adopted for the purpose of establishing minimum wildfire protection standards in conjunction with building, construction and development in State Responsibility Areas (SRA). The future design and construction of structures, subdivisions and developments in State Responsibility Area (SRA) shall provide for basic emergency access and perimeter wildfire protection measures as specified in PRC 4290. These measures shall provide for emergency access; signing and building numbering; and vegetation modification. The fire protection standards contained within PRC 4290 specify the minimums for such measures.

Public Resources Code Section 4291

Regulations under California Public Resources Code Section 4291 (PRC 4291) ensure continued maintenance of properties in conformance with the defensible space requirements outlined in PRC 4290, assure continued availability, access, and utilization of the defensible space provided during a wildfire, and require provisions for annual maintenance be included in the development plans and/or shall be provided as a condition of the permit, parcel or map approval. PRC 4291 is the law requiring annual defensible space be provided around all structures in, upon, or adjoining any mountainous area, forest-covered lands, brush-covered lands, grass-covered lands, or any land that is covered with flammable material.

California Subdivision Map Act

California Government Code Section 66474.02 of the Subdivision Map Act ("SMA") requires that three (3) specific findings of fact must be made in approving subdivisions in areas designated as high fire hazard severity zones or state responsibility areas. The findings of fact are:

1. The design and location of each lot in the subdivision, and the subdivision as a whole, are consistent with any applicable regulations adopted by the State Board of Forestry and Fire Protection pursuant to PRC 4290 and PRC 4291.

2. Supported by substantial evidence in the record, structural fire protection and services will be available for the subdivision through any of the following entities:

    a. A county, city, special district, political subdivision of the state, or another entity organized solely to provide fire protection services that is monitored and funded by a county or other public entity.

    b. The Department of Forestry and Fire Protection by contract entered into pursuant to Sections 4133, 4142, or 4144 of the Public Resources Code.

3. To the extent practicable, ingress and egress for the subdivision meets the regulations regarding road standards for fire equipment access-adopted pursuant to PRC 4290 and any applicable local ordinance.

California Building Standards Codes

The State of California provides minimum standards for building design through the California Building Code (CBC). The CBC is based on the International Building Code (IBC), which is used widely throughout the United States (generally adopted on a state-by-state or district-by-district basis) and has been modified to address particular California concerns. The primary codes with respect to development in or near the WUI include the California Building Code, Chapter 7A "Materials and Construction Methods for Exterior Wildfire Exposure" and the California Fire Code, Chapter 49 "Requirements for Wildland-Urban Interface Fire Areas". These codes require what materials are required to be used for construction for any Building Permit submitted after January 1, 2009 within the geographical areas with FHSZs designated as Very High, High, or Moderate in SRA's and Very High within Local Response Areas (LRA). Maps of these areas were developed in 2007 for California and each county.

LOCAL

Shasta County and City of Anderson Multi-Jurisdictional Hazard Mitigation Plan

The Shasta County and City of Anderson Multi-Jurisdictional Hazard Mitigation Plan (SCHMP) includes resources and information to assist in planning for hazards. The SCHMP provides a list of actions that may assist Shasta County and the City of Anderson in reducing risk and preventing loss from future hazard events. The emphasis of the SCHMP is on the assessment and avoidance of identified risks, implementing loss reduction measures for existing exposures, and insuring critical services and facilities survive a disaster. Hazard mitigation strategies and measures avoid losses by limiting new exposures identified in hazard areas, alter the hazard by eliminating or reducing the frequency of occurrence, avert the hazard by redirecting the impact by means of a structure or adapt to the hazard by modifying structures or standards.

Shasta County General Plan

The Fire Safety and Sheriff Protection Element, Public Safety Group, of the Shasta County General Plan contains policies regarding fire protection and development practices within an identified high-risk fire hazard area. These policies are intended to protect persons and structures from fires and ensure that

development minimizes the risk of creating fire hazards or defending against those hazards. The following General Plan objectives and policies are applicable to the proposed Project:

Section 5.4 – Fire Safety and Sheriff Protection

- *Objective FS-I.* Protect development from wildland and non-wildland fires by requiring new development projects to incorporate effective site and building design measures commensurate with level of potential risk presented by such a hazard and by discouraging and/or preventing development from locating in high risk fire hazard areas.

- *Objective FS-2.* Protection of life and property from crime by encouraging new development projects to incorporate effective defensible space design techniques.

    - *Policy FS-a*. All new land use projects shall conform to the County Fire Safety Standards.

    - *Policy FS-b*. Known fire hazard information should be reported as part of every General Plan amendment, zone change, use permit, variance, building site approval, and all other land development applications subject to the requirements of the California Environmental Quality Act (CEQA).

    - *Policy FS-e*. Development in areas requiring expanded levels of police and fire services shall participate in adopted County programs designed to offset the added costs for providing the expanded level of services.

The Fire Safety and Sheriff Protection Element discusses conditions and issues relevant to the protection of public health and safety related to fires and are required based on the State mandated general plan safety element in Government Code Section 65302(g).

Shasta County Emergency Operations Plan

The Shasta County Sheriff's Office of Emergency Services (OES) coordinates with Federal, State, and local agencies to prepare, respond, and recover from emergencies and natural disasters. The OES also coordinates and maintains the county Emergency Operation Center (EOC). The EOC can be used during a major incident to carry out the principles of emergency preparedness and emergency management between multiple agencies. The OES is responsible for maintaining and updating the County Emergency Operation Plan (EOP), which is an all hazards plan for Shasta County. The primary purpose of the EOP is to outline the County's all-hazard approach to emergency operations in order to protect the safety, health, and welfare of its citizens throughout all emergency management mission areas. The EOP is implemented whenever the County must respond to an emergency incident or planned event whose size or complexity is beyond that normally handled by routine operations. Emergency Function (EF) 4 coordinates and manages all fire detection, control, and suppression efforts within the jurisdiction. This support function consists of two distinct components: urban/structural fires and wildland fires. EF 6 provides mass care/sheltering, housing, and human services support for victims of natural and technological emergencies and disasters.

The EOP includes Incident Annexes (IAs) to supplement the EOP to identify critical tasks associated with to specific natural, technological, and human-caused hazards identified in the County's most current Hazard Identification and Vulnerability Assessment. IAs identify step-by-step actions for each hazard through the pre-incident, response, and recovery phases of an incident. Major Fire is identified specifically as IA 3 in the EOP. IA 3 contains a major fire checklist with three discrete categories: Pre-Incident Phase, Response Phase, and Recovery Mobilization.

Shasta County Communities Wildfire Protection Plan

In 2015, Shasta County updated the existing strategic fuel management plans and community wildfire protection plans and consolidate them into a single county-wide plan. The result was the adoption of the 2016 Shasta County Communities Wildfire Protection Plan (SCWPP). The SCWPP incorporated input from a multidisciplinary team of stakeholders and agencies from which a list of ten goals and objectives was developed. The overall intent included but was not limited to controlling of fuel inventories, conducting an asset/risk and prioritization assessment, development of a fuel reduction plan, development of maps to aid in planning, identification of fuel breaks, a priority list for fire safe projects, and encouraging ongoing maintenance (Shasta County, 2016).

Within the SCWPP, there are a total of ten planning areas that cover the 2,462,080-acre Shasta County planning area. The proposed Project is located on the eastern border of the Stillwater/Churn Creek area that is generally located in an around the City of Redding. The eastern half of the Project site is in the CCPA which extends eastward approximately 40 miles. According to the SCWPP, the area generally consists of rangeland but also contains numerous small communities. The SCWPP notes that these areas have experienced significant fires in the past and with current urbanization can expect future fires to be more damaging.

Stillwater-Churn Creek Planning Area

The Stillwater-Churn Creek Planning Area (SWCPA) watershed is located in southwestern Shasta County and encompasses approximately 94,096 acres. The SWCPA includes the eastern and northern suburbs of Redding, most of Shasta Lake City, and many rural homes and subdivisions outside of the cities' boundaries and includes the western portion of the proposed Project. Near the Project site, the SWCPA contains many "bedroom communities" for the city of Redding, and with other parts containing low density residential areas and rural subdivisions. Overall, topography and weather are the same within the Project area in the SWCPA as discussed above. The SCWPP does not rate the fire hazard severity of SWCPA but the Project site is mapped with vegetative characteristics of short grass and blue and valley oak woodland. There are no fuel modification plans or projects within the Project site identified in the SWCPA (Shasta County, 2016). Due to the proximity to the CCPA, wildfire risk would still be considered very high.

Cow Creek Planning Area

The CCPA encompasses approximately 275,000 acres and includes the communities of Palo Cedro, Bella Vista, Whitmore, Oak Run, Round Mountain, Montgomery Creek, and Backbone Ridge. Landownership is approximately 98% private and 2% is managed by public agencies with the Project site being within private

land. Topography within the CCPA varies from flat to mountainous and begins on the east at an elevation of approximately 340 feet to approximately 7,300 feet on the east. The Project site is in the westerly area of CCPA and is relatively flat and rolling with a few steeper areas. The summers within and around the Project site are hot and dry and winters are cool with annual precipitation approximately 25 inches. The entire CCPA is mapped with a very high fire hazard severity rating and consists of predominantly oak woodland and grassland vegetation. There are no fuel modification plans or projects within the Project site identified in the CCPA (Shasta County, 2016).

Shasta County Code of Ordinances

Title 16 – Buildings and Construction

The Chapters of the Shasta County Code under Title 16 - Building and Construction apply to all unincorporated areas; Chapter 16.04.130 addresses Fire Standards and Equipment, and Chapter 16.10.290 addresses Fire Safety Regulations. Chapter 16.08.101 – Codes Adopted, notes that the building standards, rules and regulations contained in the most recent edition of the codes specified in the California Health and Safety Code (Sections 17922 and 18938), and in Chapter 1 of Title 24, Part 2, of the California Code of Regulations (CCR) are adopted by reference by the County. The purpose of these codes is to prescribe the minimum requirements necessary to establish a reasonable level of fire safety to protect life and property from hazards created by fire, explosion, and dangerous conditions.

Chapter 8.10 – Defensible Space for Fire Protection

Chapter 8.10 – Defensible Space for Fire Protection, of the Shasta County Code is applicable to Urban Lands within the unincorporated area of Shasta County, consisting of lands located in either a zoning district in which the Shasta County Zoning Plan permits the creation of parcels that are two acres or less in size or a Planned Development zoning district. As Urban Lands, the requirements of this chapter apply within the Project area. This chapter requires responsible parties to maintain defensible space of up to 30 feet from the property line of the responsibly party's parcel when the accumulation of fuel on the parcel endangers or encroaches on a defensible space of 100 feet from the exterior perimeter of any improvement on an adjacent property that also lies entirely or partially within an Urban Lands area. The Fire Warden may require a distance greater than 30 feet but not to exceed 100 feet when it is determined that the greater distance is necessary to provide defensible space for improvements on an adjacent property.

5.19.3 THRESHOLDS OF SIGNIFICANCE

The County will use the Environmental Checklist Form in Appendix G of the State CEQA Guidelines, to determine if the proposed Project could potentially have a significant impact related to wildfire. Such an impact would occur if the proposed Project would violate the following criteria:

- Substantially impair an adopted emergency response plan or emergency evacuation plan;

- Due to slope, prevailing winds, and other factors, exacerbate wildfire risks, and thereby expose project occupants to, pollutant concentrations from a wildfire or the uncontrolled spread of a wildfire;
- Require the installation or maintenance of associated infrastructure (such as roads, fuel breaks, emergency water sources, power lines or other utilities) that may exacerbate fire risk or that may result in temporary or ongoing impacts to the environment;
- Expose people or structures to significant risks, including downslope or downstream flooding or landslides, as a result of runoff, post-fire slope instability, or drainage changes.
-

5.19.4 POTENTIAL IMPACTS AND MITIGATION MEASURES

Methodology

The potential impacts associated with the proposed Project are evaluated on a qualitative basis through a comparison of existing conditions within the proposed Project site and the anticipated Project effects. The potential for impacts from wildfires would occur if the effect described under the criteria below occurs. The evaluation of impacts of the proposed Project is based on professional judgment, analysis of the County's and state fire management policies, and the significance criteria established by Appendix G of the State CEQA Guidelines, which the County has determined to be appropriate criteria for this RDEIR.

IMPACT 5.19-1	***The Project Would Substantially Impair an Adopted Emergency Response Plan or Emergency Evacuation Plan.***

Significance: Less Than Significant Impact.

Construction of the Project would use ignition-resistant construction methods and materials to improve the ignition resistance of buildings, especially from firebrands. Therefore, development of the Proposed Project would be consistent with the 2019 California Building Code (or the most current version) and the California Fire Code (Part 9 of Title 24 of the California Code of Regulations). Fire Code Chapter 49 cites specific requirements for wildfire-urban interface areas that include, but are not limited to, creating and maintaining defensible space and managing hazardous vegetation and fuels.

As discussed in Chapter 3.0, PROJECT DESCRIPTION, The Tierra Robles Wildland Fuel/Vegetation Management Plan (TRWF/VMP) is intended to provide the management direction for the reduction of flammable vegetation from around buildings, roadways and driveways in accordance with the California Department of Forestry and Fire Protection/Shasta County Fire Department (CAL FIRE/SCFD) requirements. In order to address the need to reduce fuel loading and associated fire hazards while enhancing the onsite wildlife habitats, the TRWF/VMP divides the proposed Project into distinct Resource Management Areas

(RMA's) based on common vegetative and topographic features. The RMAs include general management prescriptions applicable to all RMAs as well as specific prescriptions tailored to individual conditions of each RMA (refer to Draft EIR Appendix 15.2, TIERRA ROBLES COMMUNITY SERVICES DISTRICT).

Implementation of the TRWF/VMP would allow for on-the-ground maintenance activities that would hand treat accumulated fuels build-ups to reduce the threat of catastrophic wildfire. The proposed Project would strategically reduce hazardous fuels by removing brush and limbing trees as prescribed in the TRWF/VMP (refer to Section 5.8, HAZARDS AND HAZARDOUS MATERIALS, and Draft EIR Appendix 15.2, TIERRA ROBLES COMMUNITY SERVICES DISTRICT, respectively). Treatments are intended to slow the rate of fire spread, reduce fire intensity, and modify fire behavior. Tree thinning would be accomplished using chainsaws and hand labor to cut trees. Slash would be disposed through chipping, piling and burning, and/or through sale of fuelwood.

For these reasons, the proposed Project would not impair and would be consistent with the County's EOP and EF 4 regarding fire detection, control, and suppression efforts within the jurisdiction.

To minimize operational impacts to emergency access, all on-site roadways would be designed in compliance with the Shasta County Fire Safety Standards as outlined in Chapters 8.10 and 16 of the Shasta County Code of ordinances prior to issuance of building permits. Primary access to and from the proposed Project would be from Boyle Road at the southern end of the Project site, with a north-south oriented internal arterial roadway (Tierra Robles Parkway) that connects with Old Alturas Road (via Chatham Ranch Drive) at the north end of the Project site. The proposed internal street network consists of approximately 15 roadway segments and would be designed and constructed to meet applicable County street standards. A secondary access is proposed at the southerly terminus of Tierra Robles Lane at Northgate Drive. The proposed connection with Northgate Drive would be gated per County fire standards and used for reciprocal emergency access only. As a result, Project operations would have a less than significant impact related to emergency response or evacuation activities within the development.

Emergency Evacuation

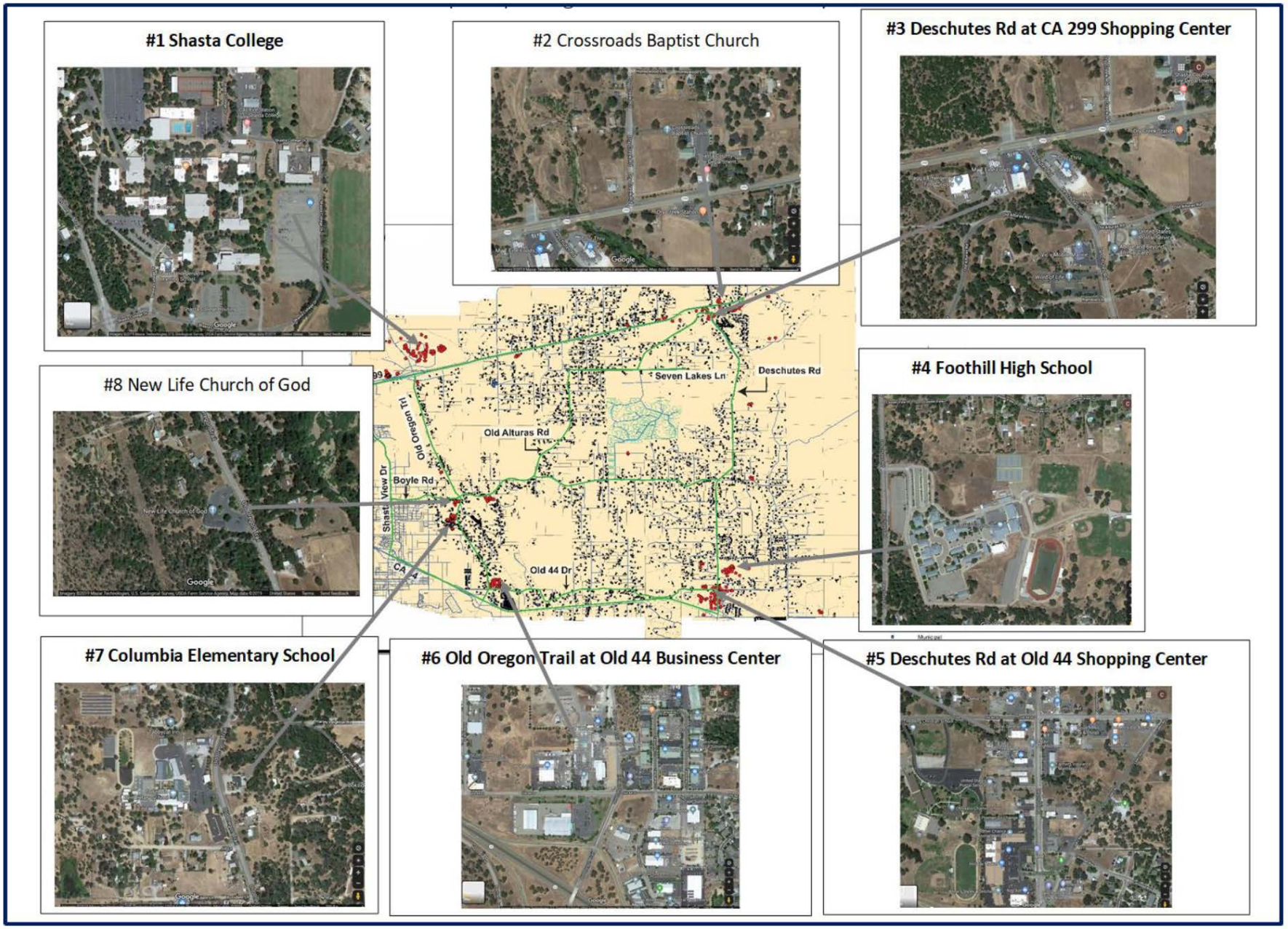
A Project specific traffic evacuation study was prepared by Cornelius Nuworsoo, Ph.D., AICP (January 2020) to determine if the proposed Project would result in a substantial increase in evacuation times or a substantial decrease in traffic speeds during a wildfire evacuation event (refer to Appendix RDEIR D-1, *Tierra Robles Area Evacuation Traffic Study*). The County does not have any specific thresholds regarding minimum evacuation times for a specific project or area such as the proposed Project. The report identified eight potential temporary refuge areas consisting of large community facilities in the surrounding area. These refuge areas are large, well known sites such as schools, shopping centers, and churches. Subject to field decisions by the fire authorities, these locations would provide short-term refuge for evacuated residents of the proposed Project. These locations are open facilities that are accompanied by large unvegetated parking areas and they can reasonably be relied upon to be available in the event of an emergency evacuation. These potential temporary refuge areas are listed below and shown in FIGURE 5.19-3, TEMPORARY REFUGE AREAS. These areas include:

1. Shasta College
2. Crossroads Baptist Church
3. Deschutes Road at CA 299 Shopping Center
4. Foothill High School
5. Deschutes Road at Old 44 Shopping Center
6. Old Oregon Trail at Old 44 Business Center
7. Columbia Elementary School
8. New Life Church of God

Based on evacuation routes to the eight temporary refuge areas, the study evaluated five different evacuation scenarios to reflect different origins of a wildfire. The availability of multiple refuge areas under each scenario poses an advantage as traffic flow would distribute to multiple locations instead of one. The distribution of traffic can result in lower evacuation times than if all motorists headed to a single location. These scenarios include:

- Split evacuations toward all directions north, south, east, and west of the Project area
- All evacuations to the north – toward Refuge Areas 1, 2, and 3
- All evacuations to the south – toward Refuge Areas 4, 5, and 6
- All evacuations to the east – toward Refuge Areas 2, 3, 4, and 5
- All evacuations to the west – toward Refuge Areas 1, 6, 7, and 8

The traffic volume anticipated to flow through the study network was estimated according to best practice assumptions in traffic flow analysis. An estimate of traffic volume estimates during evacuation events is provided in Table 5.19-2, SUMMARY OF TRAFFIC VOLUME ESTIMATES FOR EVACUATION EVENTS. Projections indicate the equivalent of approximately 8,542 passenger cars would flow through the study network as motorists from existing development in the surrounding area head toward appropriate refuge



SOURCE: De Lapide & Associates, 2020.

Temporary Refuge Areas for Evacuation

Figure 5.19-3

areas. The traffic volume estimate represents a conservative worst-case analysis because it assumes all existing and planned housing units are occupied at the time of evacuation.

Assigned volumes assumed the use of any or all 8 designated refuge areas, as appropriate, as evacuation destinations for particular circumstances that are captured under the five scenarios. The selection of through-roads for assigned volumes assumed motorists would head toward the closest refuge areas under specific scenarios. Evacuation paths were determined as the shortest travel distance paths to the nearest applicable refuge areas.

Table 15.19-2
SUMMARY OF TRAFFIC VOLUME ESTIMATES FOR EVACUATION EVENTS

Item	Volume
Traffic volume without adjustments (vehicles)	7,124
Universal Adjustments	
3.5% heavy vehicle (HV) adjustment	249
Rounding up adjustment	33
Subtotal adjustments	283
Subtotal typical network volume (passenger cars)	**7,407**
Scenario-Dependent Adjustments	
Potential additional CA 299 thru volume (passenger cars)	660
Potential additional CA 44 thru volume (passenger cars)	475
Grand total maximum potential network volume (passenger cars)	8,542
Source: Cornelius Nuworsoo, Ph.D., AICP, 2020	

The next set of five tables show summaries of evacuation results that include residual delays along the way. The times are estimates of how long it would take to completely evacuate the Tierra Robles study area under optimal throughput conditions.

Table 5.19-3, MODEL SUMMARY FOR SCENARIO 1 (EVACUATION TOWARD ALL DIRECTIONS) shows the summary for the "baseline" scenario under which evacuation is toward all cardinal directions (north, south, east, and west) to access all temporary refuge areas. This would be a likely scenario when a wildfire begins in a central location of the study area without obstructing any of the through-roads. It provides the most favorable evacuation scenario in terms of number of available refuge locations against which to compare all other scenarios.

The two most proximate refuge locations to most of the area residents are Refuge Area 3 and Refuge Area 4 which the last sets of vehicles would reach in approximately one hundred minutes. Note that it would take about 45 minutes to traverse the longest-delayed roadway segment under this scenario, but residual delay

at multiple segments along the way would nearly double the travel time for the last sets of vehicles to reach these refuge locations.

Refuge Area 2 and Refuge Area 8 are located near other major refuge areas and are offside relative to the travel paths enabled by the configuration of the area road network. The simulation of flows through the study network under this first scenario and under subsequent scenarios, indicate that areas 2 and 8 are minor locations compared to all the others. Few residents can reach these two refuge locations without passing by another more major location.

Table 5.19-3
MODEL SUMMARY FOR SCENARIO 1 (EVACUATION TOWARD ALL DIRECTIONS)

Scenario	Refuge Area	Vehicles (passenger cars)	Early Departure Network Speed (mph)	Total Clearance Time (minutes)	Total Clearance Time (hours)	Max Travel Distance (miles)	Last Vehicle Speed (mph)
All Directions	1	833	20	41	0.69	3.6	5.3
All Directions	2 & 3	2,213	18	101	1.68	4.2	2.5
All Directions	4	2,125	18	97	1.61	4.0	2.5
All Directions	5	630	20	32	0.53	2.6	4.9
All Directions	6	637	22	30	0.50	1.7	3.3
All Directions	7	950	18	46	0.77	3.6	4.7
All Directions	8	19	18	2	0.04	0.5	14.0

Source: Cornelius Nuworsoo, Ph.D., AICP, 2020

Table 5.19-4, MODEL SUMMARY FOR SCENARIO 2 (EVACUATION TOWARD NORTH DIRECTION) shows the summary for the scenario under which evacuation is toward the north cardinal direction to access Refuge Areas 1, 2, and 3. This would be a likely scenario when a wildfire begins south of the study area.

The most proximate refuge locations to most of the area residents are Refuge Area 1 and Refuge Area 3 which the last sets of vehicles would reach in approximately two hours and three and one-half hours respectively. Note that it would take about two and one-half hours to traverse the longest-delayed roadway segment under this scenario, but residual delay at multiple segments along the way would increase the travel time for the last sets of vehicles to reach these refuge locations by approximately another hour.

Table 5.19-5, MODEL SUMMARY FOR SCENARIO 3 (EVACUATION TOWARD SOUTH DIRECTION) shows the summary for the scenario under which evacuation is toward the south cardinal direction to access Refuge Areas 4, 5, and 6. This would be a likely scenario when a wildfire begins north of the study area.

The most proximate refuge locations to most of the area residents are Refuge Area 4 and Refuge Area 6 which the last sets of vehicles would reach in nearly three and one-half hours and two hours, respectively. Note that it would take about two hours to traverse the longest-delayed roadway segment under this scenario, but residual delay at multiple segments along the way would increase the travel time for the last sets of vehicles to reach these refuge locations by approximately one and one-half hours.

Table 5.19-4
MODEL SUMMARY FOR SCENARIO 2 (EVACUATION TOWARD NORTH DIRECTION)

Scenario	Refuge Area	Vehicles (passenger cars)	Early Departure Network Speed (mph)	Total Clearance Time (minutes)	Total Clearance Time (hours)	Max Travel Distance (miles)	Last Vehicle Speed (mph)
North Direction	1	2,439	18	114	1.90	6.0	3.1
North Direction	2	582	21	27	0.45	1.2	2.7
North Direction	3	4,386	17	198	3.30	8.5	2.6

Source: Cornelius Nuworsoo, Ph.D., AICP, 2020

TABLE 5.19-5
MODEL SUMMARY FOR SCENARIO 3 (EVACUATION TOWARD SOUTH DIRECTION)

Scenario	Refuge Area	Vehicles (passenger cars)	Early Departure Network Speed (mph)	Total Clearance Time (minutes)	Total Clearance Time (hours)	Max Travel Distance (miles)	Last Vehicle Speed (mph)
South Direction	4	4,338	17	194	3.23	4.1	1.3
South Direction	5	630	24	27	0.46	0.5	1.2
South Direction	6	2,439	18	113	1.88	6.3	3.4

Source: Cornelius Nuworsoo, Ph.D., AICP, 2020

Table 5.19-6, MODEL SUMMARY FOR SCENARIO 4 (EVACUATION TOWARD EAST DIRECTION) shows the summary for the scenario under which evacuation is toward the east cardinal direction to access Refuge Areas 2, 3, 4, and 5. This would be a likely scenario when a wildfire begins west of the study area.

The most proximate refuge locations to most of the area residents are Refuge Area 3 and Refuge Area 4 which the last sets of vehicles would reach in nearly two and a quarter hours. Note that it would take about one hour to traverse the longest-delayed roadway segment under this scenario, but residual delay at multiple segments along the way would increase the travel time for the last sets of vehicles to reach these refuge locations by approximately one and a quarter hours.

Table 5.19-6
MODEL SUMMARY FOR SCENARIO 4 (EVACUATION TOWARD EAST DIRECTION)

Scenario	Refuge Area	Vehicles (passenger cars)	Early Departure Network Speed (mph)	Total Clearance Time (minutes)	Total Clearance Time (hours)	Max Travel Distance (miles)	Last Vehicle Speed (mph)
East Direction	2	314	21	27	0.45	1.2	2.7
East Direction	3	2,750	19	133	2.22	5.3	2.4
East Direction	4	3,074	15	138	2.31	5.9	2.6
East Direction	5	1,268	19	61	1.02	4.0	4.0

Source: Cornelius Nuworsoo, Ph.D., AICP, 2020

Table 5.19-7, MODEL SUMMARY FOR SCENARIO 5 (EVACUATION TOWARD WEST DIRECTION) shows the summary for the scenario under which evacuation is toward the west cardinal direction to access Refuge Areas 1, 6, 7, and 8. This would be a likely scenario when fire begins east of the study area. This might even be the most likely scenario given the pattern of development and proximity of the wildland-urban interface to the eastern boundary of the study area.

The most proximate refuge locations to most of the area residents are Refuge Area 1 and Refuge Area 7 which the last sets of vehicles would reach in nearly two and one-half hours. Note that it would take about one and one-half hours to traverse the longest-delayed roadway segment under this scenario, but residual delay at multiple segments along the way would increase the travel time for the last sets of vehicles to reach these refuge locations by approximately one hour.

Table 5.19-7
MODEL SUMMARY FOR SCENARIO 5 (EVACUATION TOWARD WEST DIRECTION)

Scenario	Refuge Area	Vehicles (passenger cars)	Early Departure Network Speed (mph)	Total Clearance Time (minutes)	Total Clearance Time (hours)	Max Travel Distance (miles)	Last Vehicle Speed (mph)
West Direction	1	3,046	17	137	2.28	6.4	2.8
West Direction	6	1,268	18	67	1.11	6.3	5.6
West Direction	7	3,074	15	146	2.43	8.5	3.5
West Direction	8	19	18	2	0.04	0.5	14.0
Source: Cornelius Nuworsoo, Ph.D., AICP, 2020							

As previously noted, the analysis above includes the proposed Project as well as other existing and planned development in the surrounding area. To determine proposed Project's contribution to the evacuation times, the following tables evaluate the Project's effect on potential evacuation scenarios. Since each evacuation scenario has multiple refuge areas, the first step is to select those temporary refuge areas that include a partial or the entire traffic from the proposed Project. Table 5.19-8, LONGEST CLEARANCE TIMES TO REFUGE AREAS BY EVACUATION SCENARIO includes all refuge areas with the longest clearance times by scenario and identifies those that include traffic from the proposed Project. Depending on the scenario, four out of eight refuge areas (#1, #3, #4, and #7) would contain traffic from the proposed development. This produced a total of eight instances of those refuge areas with the longest clearance times across the five scenarios.

Table 5.19-8
LONGEST CLEARANCE TIMES TO REFUGE AREAS BY EVACUATION SCENARIO

Scenario & Direction	Refuge Area	Vehicles (passenger cars)	Early Departure Network Speed (mph)	Total Clearance Time (minutes)	Total Clearance Time (hours)	Max Travel Distance (miles)	Last Vehicle Speed (mph)	Include Traffic from Tierra Robles?
1-All	3	2,213	18	101	1.68	4.2	2.5	Yes (p)
1-All	4	2,125	18	97	1.61	4	2.5	Yes (p)
2-North	1	2,439	18	114	1.90	6	3.1	No
2-North	3	4,386	17	198	3.30	8.5	2.6	Yes (w)
3-South	4	4,338	17	194	3.23	4.1	1.3	Yes (w)

Scenario & Direction	Refuge Area	Vehicles (passenger cars)	Early Departure Network Speed (mph)	Total Clearance Time (minutes)	Total Clearance Time (hours)	Max Travel Distance (miles)	Last Vehicle Speed (mph)	Include Traffic from Tierra Robles?
3-South	6	2,439	18	113	1.88	6.3	3.4	No
4-East	3	2,815	19	133	2.22	5.3	2.4	Yes (p)
4-East	4	2,867	15	138	2.22	5.9	2.7	Yes (p)
5-West	1	3,046	17	137	2.28	6.4	2.8	Yes (p)
5-West	7	3,074	15	146	2.43	8.5	3.5	Yes (p)

Source: Cornelius Nuworsoo, Ph.D., AICP, 2020
Notes: Yes (p) = yes, partial Tierra Robles development traffic included
Yes (w) = yes, entire Tierra Robles development traffic included
No = no Tierra Robles development traffic included

Table 5.19-9, LONGEST CLEARANCE TIMES TO REFUGE AREAS WITHOUT TIERRA ROBLES DEVELOPMENT TRAFFIC shows the estimated characteristics of traffic flow without the proposed Project. Overall, with removal of Project traffic, network speeds and related clearance times would not result in a substantial change and thus would not result in enough relief for arrival at the refuge areas with the longest clearance times to make noticeable differences on evacuation.

Table 5.19-9
LONGEST CLEARANCE TIMES TO REFUGE AREAS WITHOUT TIERRA ROBLES DEVELOPMENT TRAFFIC

Scenario & Direction	Refuge Area	Vehicles (passenger cars)	Early Departure Network Speed (mph)	Total Clearance Time (minutes)	Total Clearance Time (hours)	Max Travel Distance (miles)	Last Vehicle Speed (mph)
1-All	3	1,920	18	88	1.47	4.2	2.8
1-All	4	2,073	18	94	1.57	4.0	2.5
2-North	1	2,439	18	114	1.90	6	3.1
2-North	3	4,029	17	183	3.05	8.5	2.8
3-South	4	3,980	17	179	2.99	4.1	1.4
3-South	6	2,439	18	113	1.88	6.3	3.4
4-East	3	2,713	19	120	2.00	5.3	2.6
4-East	4	3,023	15	136	2.27	5.9	2.6
5-West	1	2,740	17	124	2.07	6.4	3.1
5-West	7	3,023	15	144	2.39	8.5	3.6

Source: Cornelius Nuworsoo, Ph.D., AICP, 2020

Table 5.19-10, CHANGES IN FLOW CHARACTERISTICS WITH TIERRA ROBLES DEVELOPMENT TRAFFIC shows the estimated increases in vehicles and clearance times. The last sets of vehicles to arrive at refuge areas would endure nearly the same levels of delay through the network. Estimates of increases in their travel speeds would be no more than 0.3 miles per hour, if any. The proposed Project is estimated to add approximately 5 percent of the passenger car equivalent traffic volume to the study area traffic during evacuations. With the addition of Project traffic, the largest travel time increase for the last sets of vehicles to arrive at refuge areas would be no more than 15 minutes out of the maximum estimate of nearly 3.5 hours.

Table 5.19-10
CHANGES IN FLOW CHARACTERISTICS WITH TIERRA ROBLES DEVELOPMENT TRAFFIC

Scenario & Direction	Refuge Area	Change in Vehicles (passenger cars)	Change in Early Departure Network Speed (mph)	Change in Total Clearance Time (minutes)	Change in Total Clearance Time (hours)	Change in Max Travel Distance (miles)	Last Vehicle Speed (mph)
1-All	3	+293	0	+13	+0.21	0.0	+0.3
1-All	4	+52	0	+3	+0.04	0.0	0.0
2-North	1	0	0	0	0.00	0.0	0.0
2-North	3	+357	0	+15	+0.25	0.0	+0.2
3-South	4	+358	0	-15	+0.24	0.0	+0.1
3-South	6	0	0	0	0.00	0.0	0.0
4-East	3	+307	0	-13	+0.22	0.0	+0.2
4-East	4	+52	0	-2	+0.04	0.0	0.0
5-West	1	+306	0	-13	+0.21	0.0	+0.3
5-West	7	+52	0	-2	+0.04	0.0	+0.1

Source: Cornelius Nuworsoo, Ph.D., AICP, 2020
Note: "change" equals with Tierra Robles characteristic minus without Tierra Robles characteristic

As such, the evacuation traffic analysis concludes that while the proposed Project would add to the volume of traffic (approximately 5%) within the surrounding area, the addition of Project traffic would not substantially increase the clearance times to evacuation centers. Further, with the addition of the proposed Project, the last sets of vehicles to arrive at refuge areas would be approximately 15 minutes out of the maximum estimate of nearly 3.5 hours.

Therefore, with the addition of Project traffic the roadway network, speeds and related clearance times would not substantially change. . The Project would not result in a delay for arrival at refuge areas with the longest clearance times to make noticeable differences on evacuation. While the Project would add to the volume of traffic in the area, the scenario evaluated in Table 5.19-10 demonstrates that the Project plus existing development would not substantially delay the arrival of evacuating cars at refuge areas. . As such, the Project would not contribute to a delay during an emergency wildfire evacuation such that it would substantially impair the execution of the County's EOP.

Mitigation Measures: No mitigation measures are required.

Level of Significance After Mitigation: No mitigation measures are required. Impacts would be *less than significant*.

IMPACT 5.19-2	***Would the Project Due to Slope, Prevailing Winds, and Other Factors, Exacerbate Wildfire Risks, and Thereby Expose Project Occupants to, Pollutant Concentrations from a Wildfire or the Uncontrolled Spread of a Wildfire.***

Significance: Less Than Significant Impact with Mitigation Incorporated.

The proposed Project has been designed to complement the existing topography and would not substantially alter the existing topography of the Project site and would not change the prevailing wind patterns. Implementation of the proposed Project would result in the construction of low density rural residential uses within an area designated as a very high fire hazard zone.

Many locations throughout Shasta County, including the proposed Project site, are identified as having a very high wildland-fire hazard potential due to an intermixture of urban/rural uses and natural areas with high fuel loads and varied terrain. The presence of urban development adjacent to wildlands increases the likelihood of wildland fires, and the presence of wildlands adjacent to urban development allows fire to spread rapidly to and through developed areas.

The *Shasta County Multi-Jurisdictional Local Hazard Mitigation Plan* (SCHMP) and the *Fire Hazard Severity Zones in State Responsibility Areas Map* identifies the proposed Project site as being located in a VHFHSZ. As a result, development of the proposed Project would expose people and structures to a potential risk of loss, injury, or death involving wildland fires. The VHFHSZ includes not only the Project site, but the adjacent properties as well. These properties are generally undeveloped with limited residential development, and where residential development does occur the structures are generally surrounded by continuous vegetation and fuels that allow wildland fires to spread rapidly.

As mentioned above under Section 5.19.3, REGULATORY SETTING, the Public Safety Group, Fire Safety and Sheriff Protection subsection, of the Shasta County *General Plan* contains policies regarding fire protection and development practices within an identified high-risk fire hazard area. These policies are intended to protect persons and structures from fires and ensure that development minimizes the risk of creating fire hazards or defending against those hazards. The proposed Project complies with all applicable goals and policies in the Shasta County *General Plan* related to urban and wildland fires.

The proposed Project includes a number of measures to reduce fire hazards. As noted above under Impact 5.8-2, all proposed roadways, driveways, and buildings would be constructed in accordance with the Shasta County Fire Safety Standards. These standards also require the clearing of combustible vegetation around all structures for a distance of not less than 30 feet on each side, or to the property line. The California Public Resources Code 4291 includes a "Defensible Space" requirement of clearing 100 feet

around all buildings, or to the property line, whichever is less. Water to the Project area would be supplied by the Bella Vista Water District and fire hydrants would be placed as specified by California's State Fire Code. In addition, the applicant has prepared a Wildland-Fuel Vegetation Management Plan (herein referenced as the *Tierra Robles Wildland Fuel/Vegetation Management Plan)* to address onsite vegetation management in both areas within 100 feet of structures and 10 feet on either side of driveways for clear access for emergency vehicles, and in designated onsite management and open space areas (refer to *Resource Management Areas*, below).

Shasta County and City of Anderson Multi-Jurisdictional Hazard Mitigation Plan (SCHMP)

The SCHMP evaluates hazards for a wide array of potential issues within the County. One specific issue identified in the SCHMP is wildland fire. The LHMP states that the area of the proposed Project area "is typically grassy woodland with blue oak, valley oak, gray pine, and annual grasses. Significant fires have occurred on the valley floor, especially during north wind events, because the primary fuel is annual grasses. Each year the fire danger is recurring."[2] As noted in the County's SCHMP, the proposed Project site is located within a VHFHSZ and within the Cow Creek Fuel Reduction Planning Area.

The SCHMP identifies several mitigation strategies that the County should implement to reduce losses from future hazard events, including wildland fires. In order to implement the mitigation strategies, a series of hazard mitigation goals were developed for the Cow Creek Watershed. Goal WDF-1 addresses wildland fires and specifically states that it is the County's desire to promote disaster resistant future development.[3] Later in the SCHMP this goal is further defined as a *Very High* priority action item supported by several implementation strategies, including the following key strategy: "provide a network of fuel breaks and large fuel treatment areas at strategic locations in the watershed, helping to reduce or eliminate the spread of wildlife in the watershed."[4] The provisions of the SCHMP are consistent with the Shasta County *General Plan* related to mitigation of wildfire hazards and the proposed Project is consistent with the Shasta County *General Plan* objectives and policies noted above.

Tierra Robles Wildland Fuel/Vegetation Management Plan

The proposed Project would establish the Tierra Robles Community Services District (TRCSD) or Tierra Robles Homeowners Association (TRHOA) to manage utilities and the Project site. This would include management of the proposed Tierra Robles Wildland Fuel/Vegetation Management Plan (TRWF/VMP), Open Space Management, and Oak Woodland Management Plan. These activities would occur within five Resource Management Areas (RMAs) that specifically pertain to wildfire and are discussed in additional detail further below. The listed plans guide the TRCSD or TRHOA on how to manage the vegetative communities including oak woodlands within the subdivision and RMAs for the protection from wildland fires and to ensure the approved plans are implemented to help safeguard future residents. In addition, the TRCSD or TRHOA would be the enforcing agency to ensure the residents implement their part of the fuel management plan.

[2] *Shasta County Multi-Jurisdictional Hazard Mitigation Plan*, page 4-30. 2011.
[3] *Shasta County Multi-Jurisdictional Hazard Mitigation Plan*, page 5-21. 2011.
[4] *Shasta County Multi-Jurisdictional Hazard Mitigation Plan*, page 5-47. 2011.

The TRWF/VMP provides direction for the reduction of flammable vegetation from around buildings, roadways and driveways in accordance with CAL FIRE and Shasta County Fire Department (SCFD) requirements. To address the minimization of fuel loads and reduce the associated fire hazards, while enhancing the onsite wildlife habitats, the TRWF/VMP would divide the proposed Project into five distinct RMA's. RMA's are based on common vegetative and topographic features. Implementation of the TRWF/VMP would include ground level maintenance activities including hand removal with hand tools and chain saws of accumulated fuel to reduce the threat of catastrophic wildfire. Hazardous fuel conditions would be managed by removal of brush and limbing of trees. Treatments would slow the rate of fire spread, reduce fire intensity, and modify fire behavior. Slash would be disposed through chipping, piling and burning, and/or through sale of fuelwood.

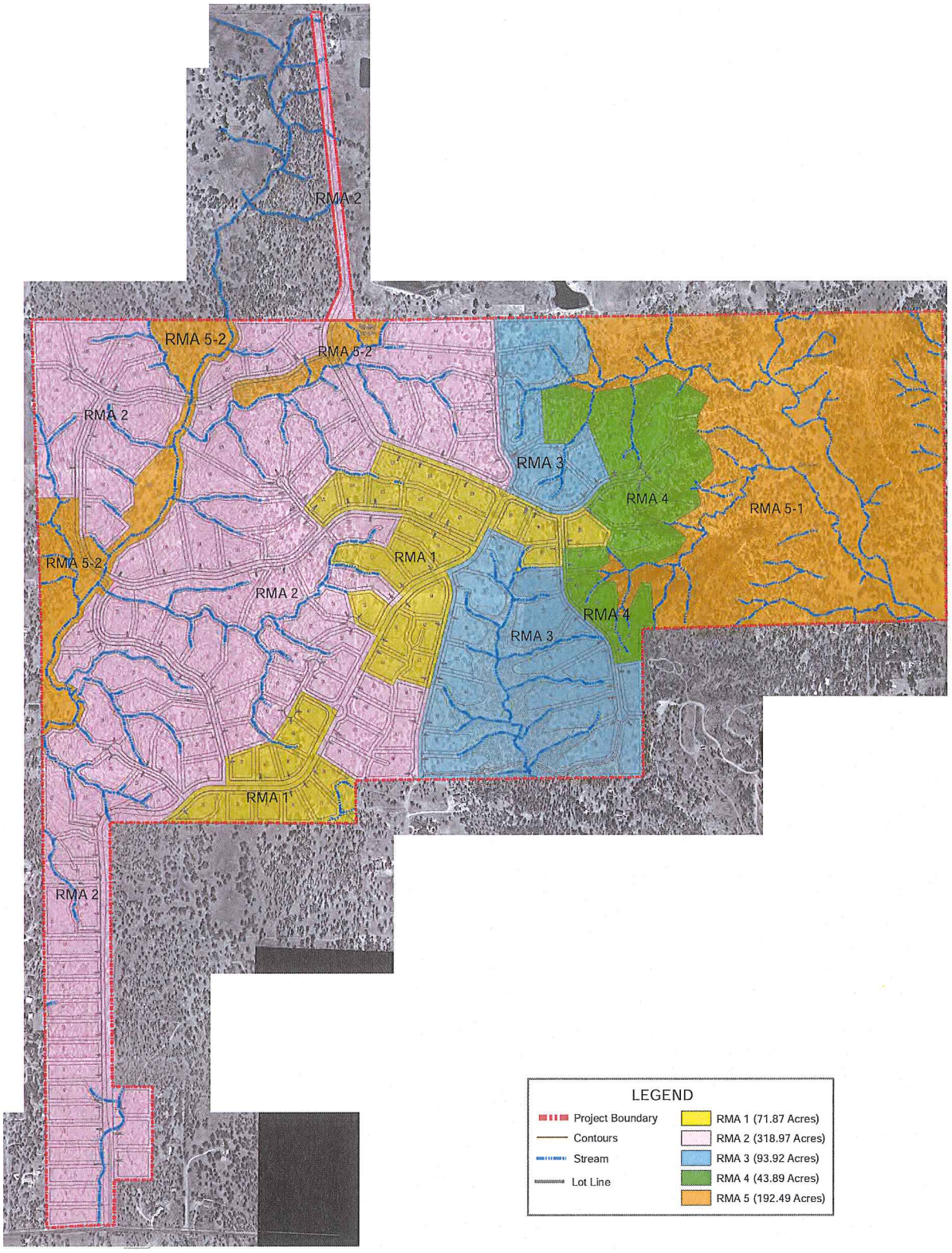
In order to comply with the requirements of CAL FIRE/SCFD, the property was subdivided into five Resource Management Areas (RMA's). These areas, while not geographically contiguous, represent five distinct and identifiable habitat types where appropriate fire fuel management prescriptions can be implemented based on specific environmental concerns and unique fire hazard conditions within each RMA. The descriptions of each of the five RMA's and specific vegetation management prescriptions are summarized below. Detailed fuel management prescriptions for each RMA are provided in the *Tierra Robles Wildland Fuel/Vegetation Management Plan* (refer to Draft EIR Appendix 15.2). In addition, refer to FIGURE 5.19-4, RESOURCE MANAGEMENT AREAS.

- *RMA 1.* Primarily located on the high terrace area of the central portion of the Project area, RMA 1 is characterized by annual grasses with scattered larger blue oaks with well-developed crowns. The guidelines state that grasses should be maintained at four inches of height or less and trees should be limbed up to eight feet about ground height. Piled grass cuttings and limbs are permitted to be burned onsite on burn days approved by the SCFD.

- *RMA 2.* This RMA consists of blue oak woodland with an annual grass understory and occasional grey pines. Tree size varies widely in this area. The management guidelines require standing and declining trees to be retained unless they pose a hazard to the land users. Smaller trees shall be thinned out in accordance with the *Tierra Robles Wildland Fuel/Vegetation Management Plan* and oaks should be limbed up to eight feet above ground height. Piled grass cuttings and limbs are permitted to be burned onsite on burn days approved by the SCFD. Additionally, shrubs planted on sloped ground shall be planted at spaces no less than twice the height of the shrubs being planted.

- *RMA 3.* This RMA is characterized by blue oaks with interior live oaks and scattered grey pines. The guidelines for RMA 3 are substantially similar to those of RMA 2 with the addition of the need to retain live oak clumps, the need to remove mid-story brush to a spacing of twice the height of the brush, and the need to remove dead and down brush and limbs.

- *RMA 4.* This RMA is unique among the RMA's 1-4 in that it has large regions of continuous fuel ladder from the understory to the canopy. The guidelines for RMA 4 incorporate many aspects noted for other RMA's above but adjust those guidelines to account for the addition of sloped terrain and increased need to manage the fuel in those areas.



SOURCE: Wildland Resource Managers, Lehmann & Assoc. Consulting, S2-J2 Engineering

N.T.S.

TIERRA ROBLES PLANNED DEVELOPMENT • RECIRCULATED EIR

Resource Management Areas

Figure 5.19-4

- *RMA 5.* This RMA has no building envelopes and consists of large tracts of open space land. RMA 5 is not contiguous and exists primarily in two tracts. The first being found in the eastern portion of the property and contains an unnamed drainage that is referred to in these materials as "East Creek". This section is designated RMA 5-1. The second tract of RMA 5, which is designated RMA 5-2, runs along Clough Creek along the northwestern portion of the property.

  Together RMA 5-1 and RMA 5-2 constitute over 26% of the total project area. The specific guidelines for the management of this area can be found in the *Tierra Robles Wildland Fuel/Vegetation Management Plan* (refer to Draft EIR Appendix 15.2). The fuel load in RMA 5-1 will be managed through the use of livestock grazing from January to May of each year. RMA 5-2 will be managed by the TRCSD or TRHOA as per the *Tierra Robles Wildland Fuel/Vegetation Management Plan.*

- General Management Requirements for All RMA's. In an effort to comply with California Public Resources Code Sections 4290 and 4291, the following prescriptions will be required for all RMAs:

  - Structures. 30 feet out from every structure remove all dead plants, grass, and weeds. Remove dead or dry leaves and pine needles from yard, roof and rain gutters. Keep tree branches 10 feet away from chimney and other trees.

  - Structures. 30 to 100 feet from every structure cut or mow annual grass to a maximum height of 4 inches. Create horizontal spacing between shrubs and trees. Create vertical spacing between grass, shrubs, and trees.

  - Vegetation. On flat to mild slopes (0-20%) planted shrubs should be spaced apart 2 times the height of the shrub (2-foot high shrubs planted a minimum of 4 feet apart).

The TRWF/VMP would be implemented and overseen by the TRCSD or TRHOA and future residents. The intent of the TRWF/VMP, using vegetation management techniques, to reduce fuel loads within the Project site and reduce the potential for catastrophic wildfire. Reduction of fuels would minimize the areas with and volume of flammable materials within proximity to residential sites. This also would help reduce the potential for spreading of wildfire into off-site areas. As part of the original Draft EIR, mitigation measure (**MM 5.8-1**) was proposed and listed specific methods to ensure compliance with the TRWF/VMP and other fire safety requirements. This included conformance with applicable Shasta County Fire Standards and PRC Sections 4291-4299. **MM 5.8-1** was included to *Chapter 5.8 Hazards and Hazardous Materials*. **MM 5.8-1** and would still be applicable to the proposed Project.

Mitigation Measure:

The text of MM 5.8-1 is provided below for reference.

MM 5.8-1: Prior to the issuance of a building permit, all required fuel-reduction work associated with construction of the onsite roadway network, the wastewater treatment plant and associated infrastructure facilities shall be completed by the Project applicant to the satisfaction of the Shasta County Fire Department. Monitoring of fire prescription activities within Resource Management Areas 1 through 4 shall be the sole responsibility of the Tierra Robles Community Services District (TRCSD) and shall occur as each private residential lot is developed and monitored to ensure substantial compliance with fire fuel management prescriptions and site development guidelines as identified in the Tierra Robles Wildland Fuel/Vegetation Management Plan, Shasta County Fire Safety Standards, and California Public Resources Code Section 4291, Defensible Space. Ongoing maintenance activities within Resource Management Area 5 shall be the sole responsibility of the TRCSD. The TRCSD shall provide annual fire fuel monitoring and compliance reports to the Shasta County Fire Department documenting conformity with fire fuel prescription activities and methods, including reporting of any enforcement actions taken to fulfill the requirements of the above referenced guidelines and standards. The specific reporting methods to be used to ensure compliance shall be determined by the TRCSD and approved by the Shasta County Fire prior to issuance of a building permit that would allow construction of the first onsite residence.

While implementation of the listed mitigation as well as the other fuel management requirements would reduce the potential for wildfire, the effects cannot be completed eliminated. The fire reduction prescriptions; however, would reduce impacts to the Project site from uncontrolled spread of wildfire. Accordingly, development of the proposed Project, in compliance with applicable Shasta County General Plan would reduce the potential for the proposed Project to be impacted and to result in additional impacts to adjacent residents from wildfire events. Implementation of MM 5.8-1 includes fire fuel prescriptions from the TRWF/VMP, Shasta County Fire Safety Standards, and defensible space requirements pursuant to California PRC Sections 4290 and 4291. It is anticipated that these measures would reduce impacts from an uncontrolled wildfire originating from the Project site or moving toward the Project site from an off-site area. Therefore, the defensible space requirements in these regulations minimize the wildfire risks exacerbated by physical properties such as slopes and wind, and as such, these measures, would reduce impacts associated with the uncontrolled spread of wildfire. Additionally, project structures would be required to comply with the California Fire Code with regard to emergency/fire access and use of building materials coupled with the measures specified in the TRWF/VMP to limit the spread of wildfire to the greatest extent possible. Therefore, impacts related to exposure of project occupants to pollutant concentrations from a wildfire or uncontrolled spread of wildfire would be less than significant.

Level of Significance after Mitigation: Impacts would be mitigated to less than significant.

IMPACT 5.19-3	***The Project Would Require the Installation or Maintenance of Associated Infrastructure (Such As Roads, Fuel Breaks, Emergency Water Sources, Power Lines or Other Utilities) That May Exacerbate Fire Risk or That May Result In Temporary or Ongoing Impacts to The Environment.***

Significance: Less Than Significant Impact.

The proposed Project includes the extension of utilities and other infrastructure including roadways, water lines, and powerlines into the Project site. The extensions are needed to provide services for the proposed future uses. Electricity would be supplied by Pacific Gas & Electric Company (PG&E). Electric improvements would be constructed only after planning and coordination with PG&E to ensure that services could be efficiently, and safety delivered to the Project site. All new electric lines, with the exception of infrastructure requiring above ground facilities such as utility boxes, would be constructed underground and built in accordance with the requirements of Shasta County and PG&E. This would reduce the potential for the transmission lines to exacerbated fire risk and impacts in this regard would be less than significant.

Natural gas lines are not located in proximity to the Project site and lines would not be extended to serve the proposed Project. Instead of natural gas, future residential and other on-site uses would be served by "trucked" in propane to fill storage tanks at individual residences. Propane would be used for heating and other appliances that are typically fueled by natural gas. All Project plans would be reviewed by the County to ensure that propane tanks are appropriate setback from structures as well as areas with flammable vegetation. This would ensure that associated fire risks, although minimal, are not substantially exacerbated. All propane tanks would be required to be filled by a licensed propane vendor and all appropriate safety procedures during transportation and dispensing would be required to be followed. Once the tanks are installed it is anticipated that only routine maintenance would be needed, and this would occur in disturbed areas. Therefore, conformance with all applicable regulations in this regard would reduce the potential for impacts from fire hazards due to the use and service of propane tanks to less than significant.

The Bella Vista Water District (BVWD) would provide water services to the Project site and would require the extension of water service lines into the Project site. Improvements would be made in adjacent roadways and previously disturbed areas so new water lines could tie into the existing distribution system. Once the lines are installed, it is anticipated that only routine maintenance would be needed, and this work would occur in previously disturbed areas. Therefore, it is anticipated that conformance with all applicable regulations in this regard would reduce the potential for increased fire hazards due from servicing water lines. This impact would be less than significant.

The construction of new on-site roadways would be required. In addition, some off-site roadway and transportation improvements would be made to ensure adequate traffic service is maintained. Off-site roadway improvements would be conducted in existing paved or adjacent areas that are already disturbed. In addition, interior roadway improvements would occur within the existing Project footprint and areas

planned for disturbance. All work would be conducted with all applicable safety measures and impacts in this regard would be less than significant.

The proposed consists of areas that consist of oak woodland and grasslands. The areas surrounding the proposed Project consist of similar vegetative patterns and rural residential uses. All of these areas are within a very high fire hazard severity zone. It should be noted that the addition of internal roadways within the Project site would allow emergency response personnel and vehicles to access the Project site and immediately surrounding areas if necessary, to suppress fires should they occur. Further, the SCFD, as part of the project approval process, would review all plans to ensure they meet fire suppression, fire access, and emergency evacuation requirements.

Based on the above discussion, the listed utility and roadway improvements would not exacerbate the potential for fire risk resulting in additional impacts to the environment. Adherence to standard state and County policies related to minimizing fire hazards would reduce impacts to less than significant. As discussed in Impact 5.19-2 above, vegetation and fuel management would be a required as a part of the TRWF/VMP. The TRWF/VMP would be implemented and overseen by the TRCSD or TRHOA and future residents. In addition, as part of the project approval process, both for the proposed Project as a whole and individual residential homes as they are built, coordination with and approval by the County would be required. The project would include adequate emergency access via existing roads at two access points. The project would require defensible space around proposed buildings, access roads, and water facilities through the implementation of the TRWF/VMP. Potable water, including water for fire suppression, would be provided by BVWD; BVWD's ability to serve the proposed Project during normal, dry, and multiple dry years is addressed in Section 5.17, Utilities and Service Systems. New electrical power on and connecting to the project site would be installed below ground, minimizing potential ignition and related fire risk above ground, at the project site in accordance with California Public Utilities Commission Electric Tariff Rule 15 Section A.3.a. Therefore, impacts related to infrastructure that exacerbates fire risk would be less than significant.

Mitigation Measures: No mitigation measures are required.

Level of Significance After Mitigation: No mitigation measures are required. Impacts would be *less than significant*.

IMPACT 5.19-4	***The Project Would Expose People or Structures to Significant Risks, Including Downslope or Downstream Flooding or Landslides, as a Result of Runoff, Post-Fire Slope Instability, or Drainage Changes.***

Significance: Less Than Significant Impact with Mitigation Incorporated.

The topography of the Project site is characterized by level to rolling terrain typically within the western portion of the Project site and steeper slopes and ridges within the eastern portion of the Project site. Most of the Project area is associated with a low-relief, low gradient alluvial terrace surface that is associated with

negligible landslide potential. Sloping ground is present in the eastern part of the Project area along three drainage heads where slopes in excess of 30% exist. These slopes are not an area of known landslide activity, nor were any observed during the preliminary geotechnical investigation completed for the Project. Slopes in the northwestern part of the Project area leading to Clough Creek are generally gently to moderately sloping. Landslide potential on ground within the Project area that slopes <30% is low; for ground sloping >30%, landslide potential is considered moderate.

The majority of the Project site is mapped as Zone X, indicating that the majority of the site lies outside of the 0.2 percent annual chance floodplain (i.e., the 500-year floodplain). A small portion of the Project site along Clough Creek is located in Zone A, indicating that a portion of the site lies within the 1 percent annual chance flood (100-year flood).

Results of a fire would result in the loss, depending on the severity of the fire, of some amount of vegetative ground cover. This would increase the potential for runoff from rain events and increase the potential for erosion, landslides, and increased downstream flows. As discussed in Impacts 5.19-1 through 5.19-3 above, the proposed Project has incorporated design elements and mitigation that would reduce the potential for wildfire to less than significant. While the proposed Project has some areas with steeps slopes these are generally at the drainage heads and development of these areas is limited. It should be noted; however, that one proposed lot, Lot #140, has the potential to be affected by the 100-year floodplain. As part of the Draft EIR, Mitigation Measure (MM 5.9-4) is required to reduce impacts associated with placement of this residence with a flood zone. MM 5.9-4 requires that the finished floor elevation of Lot #140 would be a minimum of one foot above the 100-year floodplain elevation of the Clough Creek drainage. At Lot #140, the floodplain is approximately 607.1 feet and therefore any structure finish flood elevation would be required to be at or above 608.1 feet. Verification would be subject to County Building Division at plan check.

Mitigation Measure

The text of MM 5.9-4 is provided below for reference.

> MM 5.9-4 potential hazards related to downstream flooding are less than significant. The proposed Project site is not located within a 100-year flood hazard area. The proposed Project is located within the Federal Emergency Management Agency (FEMA) Flood Insurance Rate Map Zone X, which is described by FEMA as an area determined to be outside the 0.2 percent annual chance floodplain. Due to this small percentage, it is not anticipated that flooding hazards would occur within the Project site. In addition, as described in *Section 4.7 Geology and Seismic Hazards*, the proposed Project area is flat and not susceptible to landslides. Thus, impacts would be less than significant.

Based on these factors it is anticipated that the proposed Project would not expose people or structures to significant risks, including downslope or downstream flooding or landslides, as a result of runoff, post-fire slope instability, or drainage changes. Impacts in this regard are less than significant and mitigation is not required.

Level of Significance after Mitigation

Impacts would be mitigated to less than significant.

5.18.5 CUMULATIVE SETTING, IMPACTS, AND MITIGATION MEASURES

IMPACT 5.19-5 ***The Project Would Potentially Result in Cumulative Impacts Concerning Wildfire.***

Significance: Less Than Significant Impact with Mitigation Incorporated.

Cumulative projects that would have the potential to be considered in a cumulative context with the Project's incremental contribution, and that are included in the analysis of cumulative impacts relative wildfire hazards, are identified in Table 4.0, BASIS OF CUMULATIVE IMPACTS, and Table 4.-1, CUMULATIVE PROJECTS CONSIDERED. However, as noted in Chapter 4.0, some cumulative discussions can require a different geographic area than the cumulative projects list. In the case of wildfire, and specifically with regard to evacuations, more than the list of projects were considered. The evacuation analysis considered an evacuation area envelope bound approximately by CA 299 to the north, CA 44 to the south, Old Oregon Trail on the west, and Deschutes Road on the east.

The incremental effects of the proposed Project with other past, present, and reasonably foreseeable projects related to wildfire are anticipated to be minimized through the incorporation of the above listed mitigation (or similar mitigation for other projects as needed), and through project design and management, and through the plan review process.

Like the proposed Project, cumulative development occurring within FHSZs would be subject to risk of wildfire hazards. Development of cumulative projects occurring within FHSZs would be subject to compliance with the 2019 California Building Code (or the most current version) and the California Fire Code (Part 9 of Title 24 of the California Code of Regulations). All proposed construction would be required to meet minimum standards for fire safety. Development occurring within Shasta County would be subject to review by the County staff and SCFD to ensure cumulative development is designed to provide a minimum of fire safety and support fire suppression activities, including compliance with state and local fire codes, fire sprinklers, a fire hydrant system, paved access, and secondary access routes. Implementation of these plans and policies, in conjunction with compliance with the Fire Code and County and SCFD building regulations, would ensure cumulative impacts with respect to wildfire hazards are less than significant.

With regard to emergency evacuation, the Project specific evacuation study considered a broad evacuation area described above. The analysis included the equivalent of approximately 8,542 passenger cars would flow through the studied evacuation network as motorists head toward appropriate refuge areas. This cumulative traffic volume estimate is considered a conservative worst-case analysis because it assumes all existing and planned housing units are occupied at the time of evacuation. The analysis determined that the

Project would not result in a substantial change in the evacuation times and evacuation speeds during an emergency evacuation (less than 15 minutes over a three and one-half hour period, and less than 0.3 mile per hour, respectively). Therefore, potential impacts on an emergency evacuation are not cumulatively considerable and less than significant.

The proposed Project would comply with all applicable, State and local regulations related to reducing the potential for wildfire to occur as well as reducing the severity and after effects of wildfires. The proposed Project includes 5 RMAs for which specific management actions would be prescribed based on the vegetation and other characteristics of the areas. Use of the RMAs would help reduce the potential for wildfire on a cumulative project basis. Inclusion of these strategies as well as MM 5.8-1 would ensure that impacts from wildfires are controlled or minimized and the related impacts would be less than significant.

The proposed Project, in conjunction with other past, present and reasonably foreseeable projects also would not result in cumulative effects associated with landslides and erosion which can be exacerbated by wildfires if a project is located in areas susceptible to landslides or located on areas with steep slopes. This is enforced through compliance with the California Building Code, California Fire Code, County and FFPD requirements, and standard engineering practices (e.g., anchored foundations, stabilized slopes, and retaining walls).

Therefore, the proposed Project would not result in incremental effects to wildfire that could be compounded or increased when considered together with similar effects from other past, present, and reasonably foreseeable probable future projects. The proposed Project would not result in cumulatively considerable impacts to or from wildfires.

Mitigation Measure

Implementation of Mitigation Measure 5.8-1.

Level of Significance after Mitigation: Impacts would be mitigated to less than significant.

REFERENCES

CAL FIRE, 2007. Fire Hazard Severity Zones in SRA, Adopted by CAL FIRE on November 7, 2007. Available: https://osfm.fire.ca.gov/media/6804/fhszs_map45.pdf. Accessed: December 3, 2019.

Cornelius Nuworsoo, Ph.D., AICP. *Tierra Robles Area Evacuation Traffic Study*. January 2020

Shasta County. *Shasta County General Plan*. September 2004.

Shasta County, 2016 – Shasta County Communities Wildfire Protection Plan.

Stillwater-Churn Creek Planning Area, Available: http://108.163.221.124/~westerns/wp-content/CWPP2016/11-Stillwater-ChurnCWPP2016.pdf.

Cow Creek Planning Area, Available: http://108.163.221.124/~westerns/wp-content/CWPP2016/03-CowCreekCWPP2016.pdf.

Shasta County. *Shasta County and City of Anderson Multi-Jurisdictional Hazard Mitigation Plan*. November 7, 2017.

Weatherspark, 2019. Average Weather in Redding, California – United States. Available: https://weatherspark.com/y/664/Average-Weather-in-Redding-California-United-States-Year-Round. Accessed: December 3, 2019.

Wildland Resource Managers. *Tierra Robles Wildland Fuel/Vegetation Management Plan.* July 2015.