4.16 WILDFIRE

This chapter the regulatory framework and existing conditions on the project site related to wildfire and analyzes the potential for the project to result in wildfire impacts.

4.16.1 ENVIRONMENTAL SETTING

4.16.1.1 REGULATORY FRAMEWORK

This section summarizes key State, District, and local regulations and programs related to wildfire which the District considered in evaluating the potential for the proposed Land Use Plan to have a significant effect related to wildfire. There are no relevant federal regulations applicable to the proposed project.

State Regulations

California Building Code

The State of California provides a minimum standard for building design through Title 24 of the California Code of Regulations (CCR), commonly referred to as the "California Building Code" (CBC). The CBC is located in Part 2 of Title 24. The CBC is updated every three years, and the current 2016 CBC went into effect in January 2017; the 2019 CBC will take effect in 2020. The City of Concord adopted the CBC into its Municipal Code (see below). Commercial and residential buildings are plan-checked by local City and County building officials for compliance with the CBC. Typical fire safety requirements of the CBC include: the installation of sprinklers in all high-rise buildings; the establishment of fire resistance standards for fire doors, building materials, and particular types of construction; and the clearance of debris and vegetation within a prescribed distance from occupied structures in wildfire hazard areas.

Chapter 7A of the CBC, Materials and Methods for Exterior Wildfire Exposure, prescribes building materials and construction methods for new buildings in a Fire Hazard Severity Zone. Chapter 7A contains requirements for roofing; attic ventilation; exterior walls; exterior windows and glazing; exterior doors; decking; protection of underfloor, appendages, and floor projections; and ancillary structures.

California Fire Code

The California Fire Code (CFC) is Part 9 of Title 24. The CFC includes provisions and standards for emergency planning and preparedness, fire service features, fire protection systems, hazardous materials, fire flow requirements, fire hydrant locations and distribution, and the clearance of debris and vegetation within a prescribed distance from occupied structures in wildfire hazard areas. The City of Concord adopted the CFC into its Municipal Code (see below).

Chapter 49 of the CFC, Requirements for Wildland-Urban Interface Fire Areas, prescribes construction materials and methods in fire hazard severity zones; requirements generally parallel CBC Chapter 7A. The CFC is updated on a three-year cycle; the current 2016 CFC took effect in January 2017; the 2019 CFC will take effect in 2020.

California Public Resources Code

California Public Resources Code (PRC) Sections 4291 *et seq*. requires that—for buildings on or adjoining a mountainous area, forest-covered lands, brush-covered lands, grass-covered lands, or land covered in flammable materials—brush, flammable vegetation, or combustible growth within 100 feet of buildings be removed.

California PRC Section 4290 requires the State Board of Forestry and Fire Protection to adopt regulations implementing minimum fire safety standards for defensible space that would be applicable to lands within the State Responsibility Area (SRA) and lands within very high fire hazard severity zones.

State Responsibility Area Fire Safe Regulations

SRA Fire Safe Regulations outline basic wildland fire protection standards and can decrease the risk of wildfire events in the wildland interface. SRA Fire Safe Regulations do not supersede local regulations that equal or exceed minimum State regulations. The State statute for wildfire protection is PRC Section 4290. Requirements in the PRC include information on:

- Road standards for fire equipment access.
- Standards for signs identifying streets, roads, and buildings.
- Minimum private water supply reserves for emergency fire use.
- Fuel breaks and greenbelts.

California Department of Forestry and Fire Protection

The California Department of Forestry and Fire Protection (CAL FIRE) is dedicated to the fire protection and stewardship of over 31 million acres of California's wildlands. The Office of the State Fire Marshal supports CAL FIRE's mission to protect life and property through fire prevention engineering programs, law and code enforcement, and education. The Office of the State Fire Marshal provides for fire prevention by enforcing fire-related laws in State-owned or operated buildings; investigating arson fires in California; licensing those who inspect and service fire protection systems; approving fireworks for use in California; regulating the use of chemical flame retardants; evaluating building materials against fire safety standards; regulating hazardous liquid pipelines; and tracking incident statistics for local and State government emergency response agencies. The California Fire Plan is the State's road map for reducing the risk of wildfire through planning and prevention to reduce firefighting costs and property losses, increase firefighter safety, and contribute to ecosystem health. The California Fire Plan is a cooperative effort between the State Board of Forestry and Fire Protection and CAL FIRE.

Governor's Office of Emergency Services

The Governor's Office of Emergency Services (Cal OES) was established on January 1, 2009—created by Assembly Bill (AB) 38, which merged the duties, powers, purposes, and responsibilities of the former Cal OES with those of the Governor's Office of Homeland Security. Cal OES is responsible for the coordination of overall State agency response to major disasters in support of local government. Cal OES is responsible for ensuring the State's readiness to respond to and recover from all hazards—natural, manmade, emergencies, and disasters—and for assisting local governments in their emergency preparedness,

response, recovery, and hazard mitigation efforts. In 2018, Cal OES completed a State Hazard Mitigation Plan, which designated fire hazard severity zones and wildland-urban interface areas.[1]

2018 Strategic Fire Plan for California

CAL FIRE produced the 2018 *Strategic Fire Plan for California*, which contains goals, objectives, and policies to prepare for and mitigate for the effects of fire on California's natural and built environments.[2] The 2018 *Strategic Fire Plan for California*, focuses on fire prevention and suppression activities to protect lives, property, and ecosystems; in addition to providing natural resource management to maintain to State forests as a resilient carbon sink to meet California's climate change goals. A key component of the 2018 *Strategic Fire Plan for California* is the collaboration between communities to ensure fire suppression and natural resource management is successful.[3]

California Public Utilities Commission

In 2007, wildfires in southern California were ignited by overhead utility power lines and aerial communication facilities near power lines. In response, the California Public Utilities Commission (CPUC) began considering and adopting regulations to protect the public from fire hazards due to overhead power lines and nearby aerial communication facilities. The CPUC publishes a Fire-Threat Map under Rulemaking 15-05-006, following procedures in Decision 17-01-009, revised by Decision 17-06-024, which adopted a work plan for the development of a utility High Fire-Threat District where enhanced fire safety regulations in Decision 17-12-024 apply.[4] The fire regulations require electric utilities to:[5]

- Prioritize the correction of safety hazards.
- Correct non-immediate fire risks in "Tier 2" (elevated fire threat) areas on the CPUC High Fire-Threat District within 12 months, and in "Tier 3" (extreme fire threat) areas within 6 months.
- Maintain increased clearances between vegetation and power lines within the High Fire-Threat District.
- Maintain stricter wire-to-wire clearances for new and reconstructed facilities in Tier 3 areas.
- Conduct annual inspections of overhead distribution facilities in rural areas of Tier 2 and Tier 3 areas.
- Prepare a fire prevention plan annually if overhead facilities exist in the High Fire-Threat District.

[1] California Office of Emergency Management, 2018, California State Hazard Mitigation Plan, https://www.caloes.ca.gov/HazardMitigationSite/Doecuments/002-2018%20SHMP_FINAL_ENTIRE%20PLAN.pdf, accessed on April 25, 2019.

[2] California State Board of Forestry and Fire Protection, 2018, 2018 Strategic Fire Plan for California, http://cdfdata.fire.ca.gov/pub/fireplan/fpupload/fpppdf1614.pdf, accessed on April 25, 2019.

[3] California State Board of Forestry and Fire Protection, 2018, 2018 Strategic Fire Plan for California, http://cdfdata.fire.ca.gov/pub/fireplan/fpupload/fpppdf1614.pdf, accessed on April 25, 2019.

[4] California Public Utilities Commission, http://www.cpuc.ca.gov/firethreatmaps/, accessed on April 30, 2019.

[5] California Public Utilities Commission, press release: CPUC Adopts New Fire-Safety Regulations, http://docs.cpuc.ca.gov/PublishedDocs/Published/G000/M201/K352/201352402.PDF, accessed on April 30, 2019

California Code of Regulations Title 14 Section 1250 et seq.: Fire Prevention Standards for Electric Utilities

CCR Title 14 Section 1250 et seq. set forth fire prevention standards for electric utilities. Sections 1254 and 1256 set forth requirements for vegetation clearance from poles, towers, and wires.[6]

Section 1254

The firebreak clearances required by PRC Section 4292 are applicable within an imaginary cylindroidal space surrounding each pole or tower on which a switch, fuse, transformer or lightning arrester is attached and surrounding each dead end or corner pole unless such pole or tower is exempt from minimum clearance requirements by provisions of Title 14 CCR Section 1255 or PRC Section 4296. The radius of the cylindroid is 3.1 meters (10 feet) measured horizontally from the outer circumference of the specified pole or tower with height equal to the distance from the intersection of the imaginary vertical exterior surface of the cylindroid with the ground to an intersection with a horizontal plane passing through the highest point at which a conductor is attached to such pole or tower. Flammable vegetation and materials located wholly or partially within the firebreak space shall be treated as follows:

(a) At ground level – remove flammable materials, including but not limited to, ground litter, duff and dead or desiccated vegetation that will allow fire to spread.

(b) From 0 to 2.4 meters (0 to 8 feet) above ground level – remove flammable trash, debris or other materials, grass, herbaceous, and brush vegetation. All limbs and foliage of living trees shall be removed up to a height of 2.4 meters (8 feet).

(c) From 2.4 meters (8 feet) to horizontal plane of highest point of conductor attachment – remove dead, diseased or dying limbs and foliage from living sound trees and any dead, diseased or dying trees in their entirety.

Section 1256

Minimum clearance required by PRC Section 4293 shall be maintained with the specified distances measured at a right angle to the conductor axis at any location outward throughout an arc of 360 degrees

Minimum clearance shall include:

(1) Any position through which the conductor may move, considering, among other things, the size and material of the conductor and its span length.

(2) Any position through which the vegetation may sway, considering, among other things, the climatic conditions, including such things as foreseeable wind velocities and temperature, and location, height and species of the vegetation.

[6] Wires are referred to as "conductors" in CCR Title 14 Section 1256.

District Regulations

East Bay Regional Park District Master Plan

The East Bay Regional Park District Master Plan (Master Plan), adopted July 16, 2013, provides policy direction for resource stewardship and development of parks within the jurisdiction of the District. The Master Plan also includes a vision, a mission statement, as well as policies in the Planning for Regional Parks and Trails (PRPT) and Financial Resources (FR) chapters that direct adequate resources for fire and public safety protection:

- PRPT28: New utility lines will be placed underground on land owned, operated, or managed by the District to retain the optimal visual qualities of the area. Rights of way and easements for utilities will not be granted without under-grounding. The District will work in cooperation with the utility companies to place existing overhead utilities underground (unless so doing conflicts with applicable codes) as soon as practical and will work with other agencies and neighbors to reduce visual impacts on adjacent lands. The District will seek to avoid the construction of high voltage power lines within the parklands, particularly in areas of sensitive or aesthetically important resources and in preserve areas.
- FR1b: The District will not open new parkland for public use unless it has adequate resources for planning and meeting the operational needs for public safety, fire protection, resources stewardship, interpretation and recreation services.

Ordinance 38

Portions of District Ordinance 38, Sections 404 to 907, pertain to wildfire

- Section 404: Fires. No person shall build, light or maintain any open outdoor fire on park property except in those facilities or areas provided and so designated for that purpose. Exceptions to this requirement must be obtained in writing from the District Fire Chief. No person shall leave a fire unattended on District parklands.
- Section 404.2: Restriction. No person shall smoke or build fires of any kind in areas where prohibited and posted during declared fire season. Extreme conditions may cause the elimination of all open flames for any purpose, or the evacuation or closure of a park.
- Section 404.3: Smoke-Free Parks. Smoking is prohibited in the East Bay Regional Park District with the exception of in overnight campsites. “Smoking” means inhaling, exhaling, burning or carrying any lighted pipe, cigar, cigarette, weed, plant or other combustible organic or chemical substance, the smoke from which is specifically designed or intended to be inhaled or drawn into the nose or mouth. In addition “smoking” for the purpose of this Ordinance includes the use of any vapor device, of any product name or descriptor, which releases gases, particles or vapors into the air as a result of combustion, electrical ignition or vaporization intended to be drawn into the nose or mouth (excluding any United States Food and Drug Administration approved nebulized medication) (added 4/16).

- Section 409: Miscellaneous Regulated Activities. No person shall engage in any of the following activities within the District except in areas specifically designated and set aside from time to time by the Board for such activities.
- Section 409.1. Use or possess fireworks of any kind.

  Section 907: Prohibited or Restricted Area. To insure the safety and health of persons, to avoid interference in development, construction, management, and operations to protect the lands of the District and its neighbors during high risk fire weather, or to provide for the security, safeguarding and preservation of persons and property in the District and portions thereof, the General Manager or his designee may from time to time upon such finding declare an area closed, entry prohibited, entry regulated, or limited to further entry, and specify the period therefore. If the order is to close an area, the order may exclude such reasonable categories of persons who may enter therein in the conduct of such proper activities or official duties as the General Manager may prescribe. If the order is to limit the number of person in an area, no person shall enter the area unless specifically authorized.

  When by order a prohibited or limited area has been so declared, no person so prohibited shall enter therein, and all prohibited person within such area at the time it is so declared shall leave the same without any appreciable delay, and in so doing shall obey and abide by all instructions of the authorized District employee.

East Bay Regional Park District General Conditions

The District's General Conditions contain Article 26, Fire Hazards and Preventions, which states:

(a) The Contractor will be held responsible for fire ignited by the Contractor's employees, subcontractors, or equipment. Employees shall not be allowed to start fires. No open flames shall be permitted.

(b) The Contractor shall take necessary precautions to guard against and eliminate fire hazards that may cause damage to construction work, building materials, equipment, public, and private property, including grassland, brush, and trees.

(c) Flammable materials shall not be poured into drain lines, but shall be disposed of in a legal manner.

(d) Fire hydrants shall be kept accessible to fire-fighting equipment at all times.

(e) Contractors shall comply with State law requirements for burning and use of combustion engines including but not limited to Public Resources Code Sections 4427, 4431, 4435, and 4442.

East Bay Regional Park District Wildfire Hazard Reduction and Resource Management Plan (2009)

The District's Wildfire Hazard Reduction and Resource Management Plan (Wildfire Hazard Plan) provides long-term strategies for reducing fuel loads and managing vegetation within District lands. The Wildfire

Hazard Plan identifies and describes the vegetation types and their associated fuel characteristics and identifies potential fuel treatment methods. Specific recommendations and guidelines for reducing fuel loads and managing vegetation at recommended treatment areas are also provided. Recommendations include types and frequency of fuel treatment actions, considerations for selecting treatments, suggested end-state vegetation types, and concerns regarding plant and animal species and other site-specific features that could potentially be affected by fuel treatment activities. Because the project site was not yet transferred to the District at the time that the Wildfire Hazard Plan was written, the Wildfire Hazard Plan does not include site-specific vegetation treatment goals, treatment actions, or best management practices for the project site.

East Bay Regional Parks Fire Danger Operating Plan and Procedures

In 2010, the District approved the East Bay Regional Parks Fire Danger Operating Plan and Procedures (Fire Danger Operating Plan), which outlines the District's operational decisions and procedures based on the National Fire Danger Rating System (NFDRS). The Fire Danger Operating Plan presents data for five designated fire danger rating areas (FDRA) within the District. FRDAs are defined in the Fire Danger Operating Plan as areas that are usually greater than 10,000 acres in which fire danger is relatively uniform as a result of generally homogenous fuels, climate, and topography. The project site is located within the North-East FDRA.[7]

Because the project site was not yet transferred to the District at the time that the Fire Danger Operating Plan was written, the Fire Danger Operating Plan does not include the proposed Regional Park. The District would update the Fire Danger Operating Plan to include the project site following approval of the proposed project. The specific management prescription in the Plan under the management of public safety is "Access 1.21 Reduce the risk of wildfire by implementing fuels modification projects to mitigate hazards to nearby exposures, following best management practices and procedures outlined in EBRPD's Fire Danger Operating Plan and Procedures (2012) and Wildfire Hazard Reduction and Resources Management Plan (2010)."

The Fire Danger Operating Plan explains that the District utilizes the following indices to assess weather and fuel status and set corresponding restrictions:

- Motorized vehicle travel off designated roads. The District utilizes the Keetch-Byram Drought Index to measure soil moisture to track the growth, drying, and curing cycle of grass, which is the principle fuel in which vehicle fires start and spread. When the index is great than 200 for five continuous days and expected to remain there for the remainder of the fire season, motorized vehicle travel is restricted off of designated roadways.
- Fire danger. The District uses the Burning Index to measure fuel conditions (based on moisture levels in live and dead plants) and the wind's effect to assess fire behavior and the effort to contain a fire. The Burning Index relates to the average flame length and fire intensity expected. When the index is greater than 45 for five continuous days and expected to remain there for the remainder of the fire season, smoking is restricted in wildland areas. In the North-East FDRA, where the project site is

[7] East Bay Regional Park District, 2012, East Bay Regional Parks Fire Danger Operating Plan and Procedures, page 23.

located, a Burning Index of 48 to 54 is designated as a "very high" fire danger rating and 55 and above is an "extreme" fire danger rating.

The District also measures fire suppression resource drawdown to assess when wildland fire suppression resources are available for local assignment or reassignment. A maximum drawdown of normally available District resources signals that out-of-district commitments cannot be made unless approved by the District Fire Chief and necessitates activity restrictions within the parks. The maximum drawdown is reached with all of the following resources are committed out of the area:

- One fire officer.
- One Type 4 engine with two personnel.
- One Type 3 engine with 3 to 4 personnel.
- Office of Emergency Services engine with 3 to 4 personnel.

Within the North-East FDRA, where the project site is located, the District implements the following restrictions and activations based on the following corresponding conditions:

- When the Burning Index is greater than 25, the District activates a staff engine in the North-East FDRA.
- When the Burning Index is greater than 53, the District implements extended staffing hours.
- When Red Flag Warning conditions exist or are imminent, the District implements 24-hour staffing.
- When the Burning Index is 0 to 17, the District's dispatch level is considered to be "low." When the burning Index is 18 to 24, it is considered "medium." When it is greater than 25, it is considered "high."
- When the forecasted Burning Index is greater than 47, the District restricts gas-powered equipment unless on green, irrigated grass; when the forecasted Burning Index is greater than 47 for five continuous days and expected to remain there for the remainder of the season, the District restricts campfires and barbeques outside of developed recreational areas.
- When maximum drawdown of wildland fire suppression resources exists and Red Flag Warning conditions exist, the District implements park closures.

East Bay Regional Park District Fire Restriction Levels[8]

The District maintains fire danger information signs at a number of its parks. The signs explain fire danger levels and corresponding restrictions for park users, park employees, and contractors. Fire danger levels include the following:

- Low: No Restrictions.
- Moderate: No Restrictions.
- High: No Restrictions.

[8] East Bay Regional Park District, Fire Weather Information, https://www.ebparks.org/about/fire/fire_weather_information.htm, accessed on July 23, 2019.

- Very High: Level 1 Restrictions.
- Extreme: Level 2 Restrictions.

When fire danger levels are "low," "moderate," or "high," there are no restrictions. Many days from July through October may be rated "very high" or "extreme," with corresponding restrictions. Level 1 and Level 2 restrictions are as follows:

- Level 1 (Very High):
  - Smoking allowed inside of enclosed vehicles, designated day-use picnic areas, campgrounds, or developed recreational areas only.
  - Campfires or barbeques allowed inside of designated day-use picnic areas, campgrounds, or developed recreational areas only; gas-fueled stoves are permitted in all areas.
  - Vehicles are restricted to driving only on designated roadways; no cross-country driving.
  - No use of gasoline-powered equipment (e.g., mowers in rough areas, weed eaters, chain saws, welders and generators) outside of irrigated areas, designated campgrounds, or developed recreational areas, unless extra protection fire safety measures approved by the Fire Chief are implemented.
- Level 2 (Extreme):
  - Smoking allowed inside enclosed vehicles only.
  - Open fires, campfires, or barbeques of any type are not allowed; gas-fueled stoves are permitted in all areas.
  - Vehicles are restricted to driving only on designated roadways; no cross-country driving.
  - No use of gasoline powered equipment (e.g., mowers in rough areas, weed eaters, chain saws, welders and generators) outside of irrigated areas, designated campgrounds, or developed recreational areas; maintenance of irrigated areas is permitted. Road grading is permitted provided extra protection fire safety measures approved by the Fire Chief are implemented.
  - Contractors may continue working on District lands provided they institute extra protection fire safety measures approved by the Fire Chief; contractor operations must be directly supervised by a District representative to ensure specified extra protection fire safety measures are implemented.

The District closes its parks when both the District Fire Department has limited resources to fight fires and the National Weather Service has declared a Red Flag Warning. A Red Flag Warning is declared when there is a likelihood of hot, dry winds from the east (called the "Diablo Winds"), low relative humidity and low to moderate off-shore windows, or there is a prediction of severe lightning storms.

The District maintains a "Park Closures and Notices" webpage to post current fire weather conditions and parkland restrictions. It is rare for the District to completely close a park; rather, the District typically institutes Level 1 or Level 2 restrictions and employs fuel reduction techniques in the Wildfire Hazard Plan.

Local Regulations

Contra Costa County/City of Concord Local Hazard Mitigation Plan

Contra Costa County updated its Local Hazard Mitigation Plan in 2018, with the participation of the City of Concord, whose specific policies are included as an "annex".[9] The project site lies within the planning area for the Local Hazard Mitigation Plan. The Local Hazard Mitigation Plan complies with federal and State hazard mitigation planning requirements to establish eligibility for funding under Federal Emergency Management Agency (FEMA) grant programs. The Disaster Mitigation Act (DMA; Public Law 106-390), passed in 2000, shifted the federal emphasis toward planning for disasters before they occur. The DMA requires State and local governments to develop hazard mitigation plans as a condition for federal disaster grant assistance. Regulations developed to fulfill the DMA's requirements are included in Title 44 of the Code of Federal Regulations (44 CFR). The current update meets federal requirements for updating hazard mitigation plans on a five-year cycle. Risk assessment models were used in order to rank hazards and gauge potential impacts of each hazard of concern. Earthquake hazard was ranked as high followed by landslides, severe weather, wildfire, dam and levee failure, flood, sea level rise, tsunami, and drought.

The Local Hazard Mitigation Plan outlines activities designed to reduce or eliminate losses resulting from natural hazards. Contra Costa County Office of Emergency Services opened the planning process for the hazard mitigation plan to all eligible local governments within the planning area. Planning partners included the City of Concord, as well as local police departments, fire departments, city planning directors, public works departments, school districts, and water and sanitation districts.

National, State, and county databases were reviewed to locate available spatially based data relevant to the Local Hazard Mitigation Plan. Maps were produced using geographic information system (GIS) software to show the spatial extent and location of hazards when such datasets were available.

City of Concord General Plan

The Safety (S) and Noise Element of the Concord General Plan includes the following goals and policies specific to wildfire and applicable to the proposed project.

- Policy S-7.2.3: Ensure that sufficient access for fire protection services is available in all new development.
- Policy S-8.1.1: Maintain an ongoing program for disaster response, including participation in all aspects of emerging, new high-technology solutions.
- Policy S-8.1.2: Coordinate disaster response planning with surrounding cities, agencies, and Contra Costa County.
- Policy S-8.1.4: Implement the City's Local Hazard Mitigation Plan, consistent with the guidelines of the Federal Emergency Management Agency (FEMA) and the Disaster Act of 2000, and seek funding under FEMA's Hazard Mitigation Grant Program.

[9] Contra Costa County, 2018, Contra Costa County Hazard Mitigation Plan Volume 1 – Planning Area-Wide Elements, Draft Final January 2018; and Volume 2, Planning Partner Annexes.

The Local Hazard Mitigation Plan is incorporated by reference into the Concord General Plan.

City of Concord Municipal Code

The City of Concord Municipal Code (CMC), organized by Title, Chapter, and Section, contains all ordinances for the city. Title 15, Building and Building Regulation, includes regulations relevant to wildfire in Concord as follows:

- Chapter 15.65, Fire Code. The Fire Code regulates, among other things, issuance of permits where operations or business or the installation or modification of any systems regulated under the Fire Code are planned, application and collection of applicable fire permit fees, and installation of residential and commercial automatic sprinkler systems. The Fire Code also adopts the Contra Costa County Fire Protection District Ordinance (2016-23), and the 2016 CFC.
- Chapter 15.10, Building Code. Chapter 15.10 of the Municipal Code adopts the 2016 California Building Code, referred to as the Building Code.

Contra Costa County General Plan

The Public Facilities/Services Element of the County's General Plan includes goals, policies, and programs relevant to the environmental factors potentially affected by the proposed project. Although the County's General Plan does not apply directly to the project site, the project site borders unincorporated lands and therefore could affect, or be affected by, wildfire hazards on County lands. The County's General Plan includes the following goal, principle, and policies specific to fire protection and applicable to the proposed project:

- Goal 7-Y: To ensure a high standard of fire protection, emergency, and medical response services for all citizens and properties throughout Contra Costa County.
- Goal 7-AA: To incorporate requirements for fire-safe construction into the land use planning and approval process.
    - Policy 7-63: The County shall strive to achieve a total response time (dispatch plus running and set-up time) of 5 minutes in central business district, urban, and suburban areas for 90 percent of all emergency responses.

Concord Reuse Project Area Plan

The Concord Reuse Project Area Plan (Area Plan) includes policies and standards for land use, transportation, environmental protection, labor agreements, affordable housing, and public safety for the conversion of land uses within the Inland Area of the Concord Naval Weapons Station to civilian use. Adopted by the Concord City Council in 2012, the Area Plan adapted goals and concepts developed in the Area Plan that articulated the community's preferred vision for the area. The Area Plan was adopted in 2010. The Area Plan involves development of over 12,200 new housing units, over 6.1 million square feet of commercial floor space, and a variety of community facilities and city parks primarily clustered on the western portion of the former base. The Area Plan provides the following General Community Facilities and Parks (CFP) and Safety, Health, and Noise (SHN) principles and policies applicable to the project site:

- Principle CFP-3: Provide high levels of police and fire protection services to the CRP [Concord Reuse Project Area Plan] area.
  - Policy CFP-3.2: Fire stations. Plan for the eventual development of two new fire stations to serve the CRP area. Stations should be located in a way that can minimize future response time for fire and emergency medical service calls.
  - Policy CFP-3.3: Coordination with Police and Fire Departments. Coordinate planning and future development approvals with the Concord Police Department and the CCCFPD [Contra Costa County Fire Protection District] to ensure that law enforcement and public safety issues are taken into account when reviewing CRP area development proposals.
- Principle SHN-3: Promote effective fire protection measures for homes adjacent to the open space in the CRP area.
  - Policy SHN-3.1: Incorporate fire breaks, fire-resistant landscaping, adequate vegetation clearances around structures, and other vegetation management measures along the urban-open space interface to minimize the risk of wildfire on the Concord Reuse Project [Area Plan] site.

4.16.1.2 EXISTING CONDITIONS

This section describes the existing conditions relevant to wildfire hazards on and around the project site.

Wildfire Background

Types of Wildfire

There are three basic types of wildland fires:

- Crown fires burn trees to their tops; these are the most intense and dangerous wildland fires.
- Surface fires burn surface litter (that is, the top layer of the forest, brushland, or grassland floor, containing dead sticks, branches, twigs, leaves, and needles) and duff (that is, the layer of decomposing organic material lying above the soil and below the layer of surface litter). Surface fires are the easiest fires to extinguish and cause the least damage to the forest. Brush and small trees enable surface fires to reach treetops and are thus referred to as "ladder fuels."
- Ground fires occur underground in deep accumulations of dead vegetation. These fires move very slowly but can be difficult to extinguish.[10]

Wildfires burn in many types of vegetation—forest, woodland, scrub (including chaparral, sage scrub, and desert scrub), and grassland.[11] Many species of native California plants are adapted to fire. Chaparral shrubs recover from fire in either of two ways: 1) woody root crowns or burls below the soil surface that survive a fire and re-sprout; and, 2) shrubs (various species of *Manzanita* and *Ceanothus*) that are killed by

[10] Natural Resources Canada, 2018, Fire Behavior, https://www.nrcan.gc.ca/forests/fire-insects-disturbances/fire/13145, accessed on April 30, 2019.

[11] California Department of Forestry and Fire Prevention, 1999, Learning to Live with Fire, http://www.fire.ca.gov/communications/downloads/live_w_fire.pdf, accessed on April 30, 2019.

fire and produce seeds requiring intense heat from a fire to germinate.[12] Many species of conifers have seed cones requiring fire to open.[13] Between 2010 and 2017, wildfires in California burned about 265,000 acres of forest land, 207,000 acres of shrub vegetation, 99,000 acres of grassland, 18,000 acres of desert vegetation, and 14,000 acres of other vegetation types.[14]

Wildfire Causes

Many factors contribute to wildfires, including:[15]

- Fuel. Fuel can include live and dead vegetation on the ground, surface vegetation such as brush and small trees, and above-ground vegetation in tree canopies. Moisture content affects how vegetation burns. Lighter fuels such as grasses, leaves, and needles quick expel moisture and burn rapidly, while heavier fuels such as tree branches, tree trunks, and logs retain moisture and take longer to ignite.
- Weather. Temperature, humidity, wind speed, wind direction, cloud cover, precipitation amount and duration, and atmospheric stability all affect wildfires. A wet spring can cause increased vegetation growth, creating more fuel susceptible to ignition during a dry summer. Strong, dry winds can produce extreme fire conditions.
- Terrain. Site and regional topography, including slope and elevation, influence fuel and weather. Terrain affects the amount and moisture of fuel, the effect of weather (such as temperature, precipitation, and wind), potential barriers to fire spread (such as roadways and bodies of water), and land forms. Fire spreads more easily uphill than downhill.

These factors interact with each other in several ways. Climate change also affects these factors, for instance by affecting fuel ecosystems and weather patterns.

Although the term "wildfire" suggests natural origins, a 2017 study that evaluated 1.5 million wildfires in the United States between 1992 and 2012 found that humans were responsible for igniting 84 percent of wildfires, accounting for 44 percent of acreage burned.[16] Wildfires can be ignited naturally during lightning events, but are most frequently caused by human activity, such as smoking, campfires, equipment use, and arson. The three most common types of human-caused wildfires are debris burning (logging slash, farm fields, trash, etc.); arson; and equipment use.[17] Power lines can also ignite wildfires

[12] Rundel, Philip, and Gustafson, Robert, 2005, Introduction to the Plant Life of Southern California. Berkeley and Los Angeles, California: University of California Press.

[13] California Department of Forestry and Fire Prevention, 1999, Learning to Live with Fire, http://www.fire.ca.gov/communications/downloads/live_w_fire.pdf, accessed on April 30, 2019.

[14] State Board of Forestry and Fire Protection and California Department of Forestry and Fire Prevention, 2018, 2018 Strategic Fire Plan for California, http://cdfdata.fire.ca.gov/pub/fireplan/fpupload/fpppdf1614.pdf, accessed on April 30, 2019.

[15] Contra Costa County, 2018, Contra Costa County Hazard Mitigation Plan, page 13-3.

[16] Balch, Jennifer; Bradley, Bethany; Abatzoglou, John, et. al. 2017, March 14. Human-Started Wildfires Expand the Fire Niche Across the United States. Proceedings of the National Academy of Sciences: Volume 114 No. 11. https://www.pnas.org/content/pnas/114/11/2946.full.pdf, accessed on April 30, 2019.

[17] Pacific Biodiversity Institute, 2007, Roads and Wildfires, http://www.pacificbio.org/publications/wildfire_studies/Roads_And_Wildfires_2007.pdf, accessed on April 30, 2019.

through down lines, vegetation contact, conductors that collide, and equipment failures.[18] CAL FIRE determined that 16 wildfires in northern California in October 2017 were caused by electric power and distribution lines, conductors, and the failure of power poles.[19,20] Lightning is the major natural cause of wildfire in the United States.[21]

An analysis of United States Forest Service wildfire data from 1986 to 1996 determined that 95 percent of human-caused wildfires, and 90 percent of all wildfires, occurred within 0.5 miles of a road; and that about 61 percent of all wildfires and 55 percent of human-caused wildfires occurred within approximately 650 feet of a road. This analysis concluded that the increase in human-caused ignition greatly outweighs the benefits of increased access for firefighters.[22]

There are three primary methods of wildfire spread, which are listed below:

- Embers. Embers are glowing or burning pieces of vegetation or construction debris that are lofted during the wildfire, which can move up to a mile ahead of a firestorm. They are most prolific cause of home ignition at a rate of two out of every three homes destroyed. These small embers or sparks may fall on the vegetation near a home (on dry leaves, needles, or twigs on the roof) and then subsequently ignite and burn down the home. Ember storms place all structures without fire resistant landscaping and construction within miles of the fire at potential risk.
- Direct Flame Contact. Direct flame impingement refers to the transfer of heat by direct flame exposure. Direct contact will heat the building materials of the home. If the time and intensity of exposure is severe enough, windows will break and materials will ignite.
- Radiant Heat. A house can catch on fire from the heat that is transferred to it from nearby burning objects, even in the absence of direct flames or embers. Defensible space around homes significantly reduces the risk from radiant heat. A home with 100 feet of clearance from forest or shrubs will usually have minimal impact from radiant heat or direct flame.[23]

Wildfire season in the Western region of the United States, including California, recently has lengthened from a previous average of between five and seven months to a year-round occurrence, and the number of large wildfires (i.e., greater than 1,000 acres) has increased from 140 to 250 per year. This is occurring

[18] Texas Wildfire Mitigation Project, 2018, How Do Power Lines Cause Wildfires? https://wildfiremitigation.tees.tamus.edu/faqs/how-power-lines-cause-wildfires, accessed on April 30, 2019.

[19] California Department of Forestry and Fire Prevention, 2018, CAL FIRE Investigators Determine Causes of 12 Wildfires in Mendocino, Humboldt, Butte, Sonoma, Lake, and Napa Counties, https://calfire.ca.gov/communications/downloads/newsreleases/2018/2017_WildfireSiege_Cause.pdf, accessed on April 30, 2019.

[20] California Department of Forestry and Fire Prevention, 2018, CAL FIRE Investigators Determine Causes of 12 Wildfires in Mendocino, Humboldt, Butte, Sonoma, Lake, and Napa Counties, https://calfire.ca.gov/communications/downloads/newsreleases/2018/2017_WildfireSiege_Cause.pdf, accessed on April 30, 2019.

[21] Balch, Jennifer; Bradley, Bethany; Abatzoglou, John, et. al. 2017, March 14. Human-Started Wildfires Expand the Fire Niche Across the United States. Proceedings of the National Academy of Sciences: Volume 114 No. 11. https://www.pnas.org/content/pnas/114/11/2946.full.pdf, accessed on April 30, 2019.

[22] Pacific Biodiversity Institute, 2007, Roads and Wildfires, http://www.pacificbio.org/publications/wildfire_studies/Roads_And_Wildfires_2007.pdf, accessed on April 30, 2019.

[23] City of San Rafael, 2019, Wildfire Prevention and Protection Action Plan.

as average annual temperature in the Western regions of the United States has risen by nearly two degrees Fahrenheit since the 1970s and the winter snow pack has declined.[24]

Secondary Effects

The following sections describe the hazardous conditions created by wildfire effects.

Slope Instability

Post-fire conditions can pose hazards associated with unstable slopes, such as landslides, erosion, and gullying.[25] Post-fire landslide hazards include fast-moving, highly destructive debris flows that can occur in the period immediately following wildfires in response to high-intensity rainfall events, and flows that are generated over longer time periods that are accompanied by root decay and loss of soil strength. Fires increase the potential for debris flows by increasing the imperviousness of soil so that it repels water and destroying vegetation that would slow and absorb rainfall, and whose roots would help stabilize soil.[26] The burning of vegetation and soil on slopes more than doubles the rate that water will run off into watercourses.[27] Post-fire debris flows are particularly hazardous because they can occur with little warning, can exert great impulsive loads on objects in their paths, can strip vegetation, block drainage ways, damage structures, and endanger human life. Debris flows differ from mudflows in that debris flows are composed of larger particles. Post-fire debris flows are most common in the two years after a fire; they are usually triggered by heavy rainfall. It takes much less rainfall to trigger debris flows from burned basins than from unburned areas.

Air Pollution

Smoke is made up of a complex mixture of gases and fine particles produced when wood and other organic materials burn. The biggest health threat from smoke is from fine particles ($PM_{2.5}$), which are microscopic particles can penetrate the lungs and cause a range of health problems, from burning eyes and a runny nose to aggravated chronic heart and lung diseases. Exposure to particulate pollution is even linked to premature death. Some populations are more sensitive than others to smoke: for instance, people with heart or lung diseases; the elderly; children; people with diabetes; and pregnant women.[28]

[24] State Board of Forestry and Fire Protection and California Department of Forestry and Fire Prevention, 2018, 2018 Strategic Fire Plan for California, http://cdfdata.fire.ca.gov/pub/fireplan/fpupload/fpppdf1614.pdf, accessed on April 30, 2019.

[25] Contra Costa County, 2018, Contra Costa County Hazard Mitigation Plan, page 13-5.

[26] US Geological Survey, 2018, New post-wildfire resource guide now available to help communities cope with flood and debris flow danger, https://www.usgs.gov/center-news/post-wildfire-playbook?qt-news_science_products=1#qt-news_science_products, accessed on April 30, 2019.

[27] California Geological Survey, 2018, Post-Fire Debris Flow Facts, https://www.conservation.ca.gov/index/Pages/Fact-sheets/Post-Fire-Debris-Flow-Facts.aspx, accessed on April 30, 2019.

[28] Airnow. 2018. How Smoke from Fires Can Affect Your Health, https://airnow.gov/index.cfm?action=smoke.index, accessed on December 21, 2018.

Vegetation Changes

Frequent wildfires reduce the recovery of shrubs and trees—especially shrubs and trees that must produce seeds to regenerate after fire—and increase the invasion of non-native grasses, that is, convert native shrublands to non-native grassland.[29] Non-native grasses are generally more flammable than the chaparral and sage scrub vegetation that is replaced; thus, such conversion exacerbates wildfire hazards.[30] Loss of vegetation can also lead to downstream flooding.

Wildfire History in the Project Area

According to the Contra Costa County Hazard Mitigation Plan, Contra Costa County historically experiences wildfires every two to three years. In more recent years with drought conditions, wildfires have occurred annually. From 2010 to 2017, ten fires occurred in or near Contra Costa County that destroyed over 10 acres.[31] Of the fires, the 2013 Kirker Fire occurred closest to the project site, burning 492 acres along Kirker Pass Road. Figure 4.16-1 maps wildfires in the vicinity of the project site that occurred between 1950 and 2017.

Wildfire Hazards in the Project Area

According to the Contra Costa County Hazard Mitigation Plan, the East Bay's geography, weather patterns, and vegetation provide ideal conditions for recurring wildfires. During the late summer and fall, natural vegetation is extremely flammable, and wildfire is a serious hazard in undeveloped areas and sites with extensive areas of un-irrigated vegetation. Although grassland fires are easily ignited, particularly during dry weather, grassland fires are fairly easy to control if they can be reached by fire equipment. Brush fires tend to burn quickly and are very hot, and lead to the destruction of vegetative cover. A brush fire that spreads to woodland can create a destructive hot crown fire (that is, a fire that burns the entire length of a tree and spreads from treetop to treetop).[32]

The project site's location and existing conditions make the site susceptible to wildfire hazards, as described below.

Hazard Zone Mapping

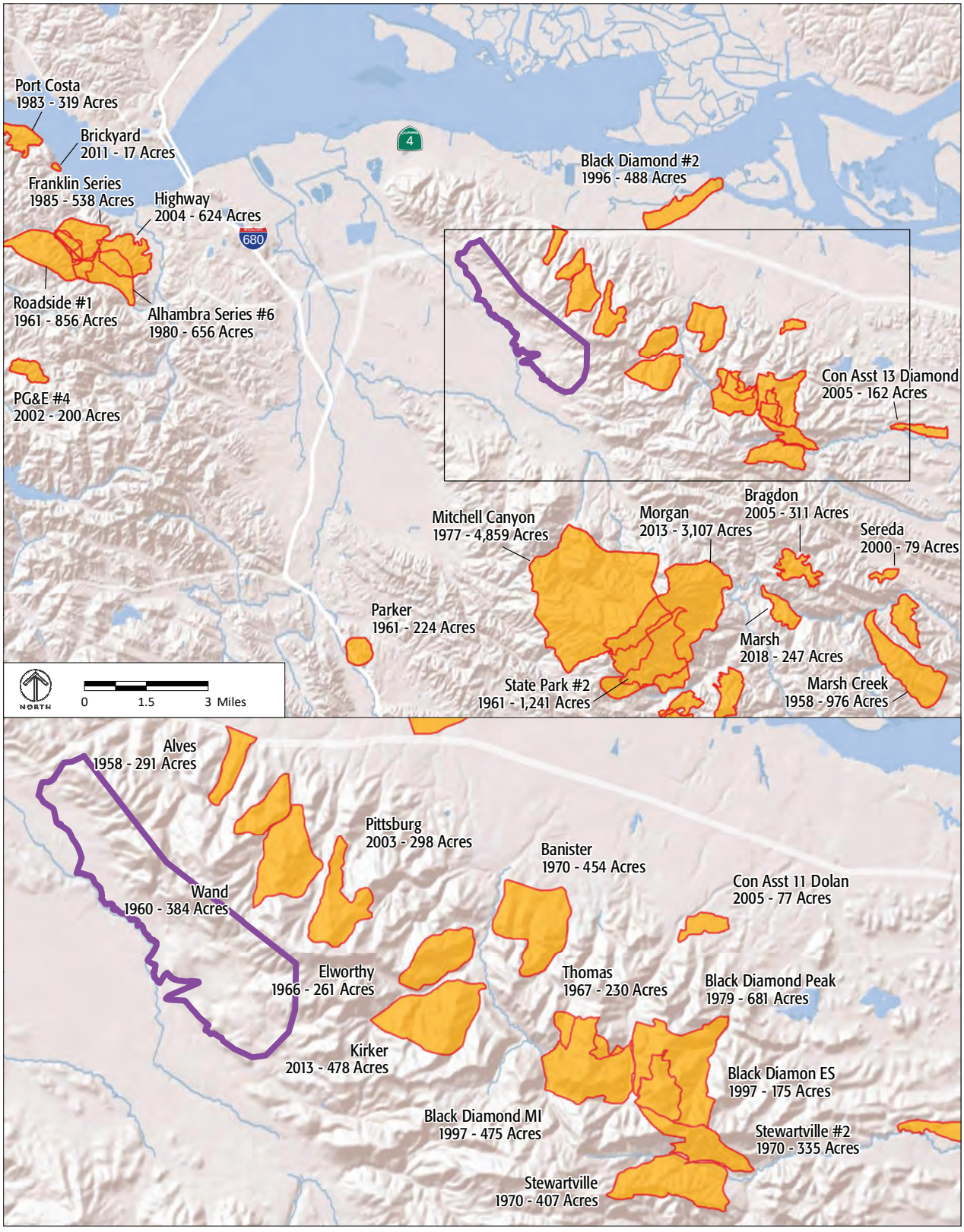
Various entities evaluate potential wildfire risks and publish data and maps showing wildfire risks for locations within California.

[29] US Geological Survey, 2012, Fire-Driven Alien Plant Invasion in a Fire-Prone Community, http://www.californiachaparral.com/images/Fire_driven_alien_plants_Brief.pdf, accessed on April 30, 2019.

[30] See University of California Division of Agriculture and Natural Resources, 2009, Invasive Plants and Wildfires in Southern California, https://anrcatalog.ucanr.edu/pdf/8397.pdf, accessed on April 30, 2019.

[31] Contra Costa County, 2018, Contra Costa County Hazard Mitigation Plan, page 13-2.

[32] Contra Costa County, 2018, Contra Costa County Hazard Mitigation Plan, page 13-5.



Source: PlaceWorks, 2016; CalFIRE, 2019; ESRI 2015

Project Site

Historic Wildfires 1950-2018

Figure 4.16-1

Wildfire History near the Project Site, 1950 to 2017

CAL FIRE

CAL FIRE publishes maps recommending fire hazard severity zones for every California county. The maps identify lands in California as falling within one of the following management areas: Local Responsibility Area (LRA), State Responsibility Area (SRA), and Federal Responsibility Area (FRA). Within each of these areas, a single agency has direct responsibility: in LRAs, local fire departments or fire protection districts are responsible; in SRAs, CAL FIRE is responsible; in FRAs, federal agencies such as the United States Forest Service, National Park Service, Bureau of Land Management, United States Department of Defense, United States Fish and Wildlife Service, and Department of the Interior are responsible.[33]

Within the LRA, CAL FIRE designates lands as being within a Very High Fire Hazard Severity Zone (VHFHSZ) or non-VHFHSZ. The LRA maps also show the VHFHSZ and non-VHFHSZ areas within the SRA and FRA but do not differentiate lands within the SRA and FRA from each other (that is, SRA and FRA areas are mapped together).

Within the SRA, CAL FIRE designates Moderate Fire Hazard Severity Zones, High Fire Hazard Severity Zones, and VHFHSZs. The SRA maps also indicate which lands area within the LRA and which are within the FRA, but do not show the hazard zones within the LRA and FRA.

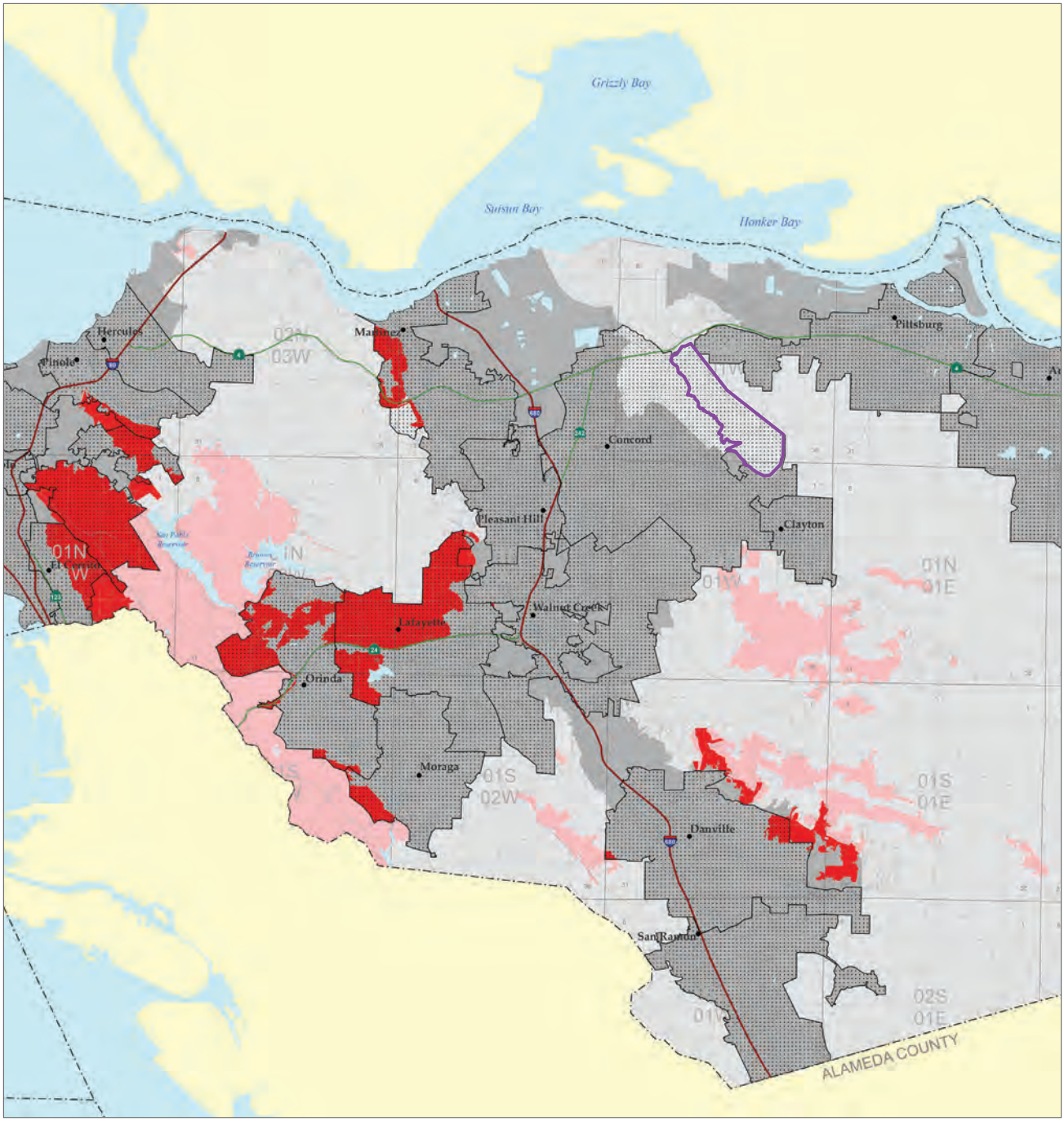
As shown in Figure 4.16-2, the CAL FIRE map for the LRA in Contra Costa County identifies the project site as within a non-VHFHSZ. As shown in Figure 4.16-3, the CAL FIRE map for the SRA in Contra Costa County identifies the project site as being within the FRA. Although CAL FIRE maps the site as being within the FRA, upon transfer to the District, the project site would no longer be under the management of the federal government and would become part of the LRA.

Figure 4.16-3 also shows that the project site is adjacent to lands to the east and north that are within the SRA and designated as being within the Moderate and High Fire Hazard Severity Zone.

CAL FIRE also publishes mapping data for the wildland–urban interface (WUI). The WUI includes areas susceptible to wildfires where wildland vegetation and urban (or suburban) development occur together.[34] Fires in the WUI result in direct damage to the built environment and harm to residents. The WUI area mapped by CAL FIRE represents the overlap between the following: land uses containing a housing density of one housing unit per 40 acres or denser, and areas within 2,400 meters (approximately 1.5 miles) of those land uses; areas within 2,400 meters of lands calculated to have a “high,” “very high,” or “extreme” fire threat, based on a combination of fuel rank and fire rotation; and areas designated as “communities at risk,” which are areas with a density of one housing unit per 20 acres or denser that are within 2,400 meters of areas with high, very high, or extreme fire threat. As shown on Figure 4.16-4, the project site is entirely within the WUI.

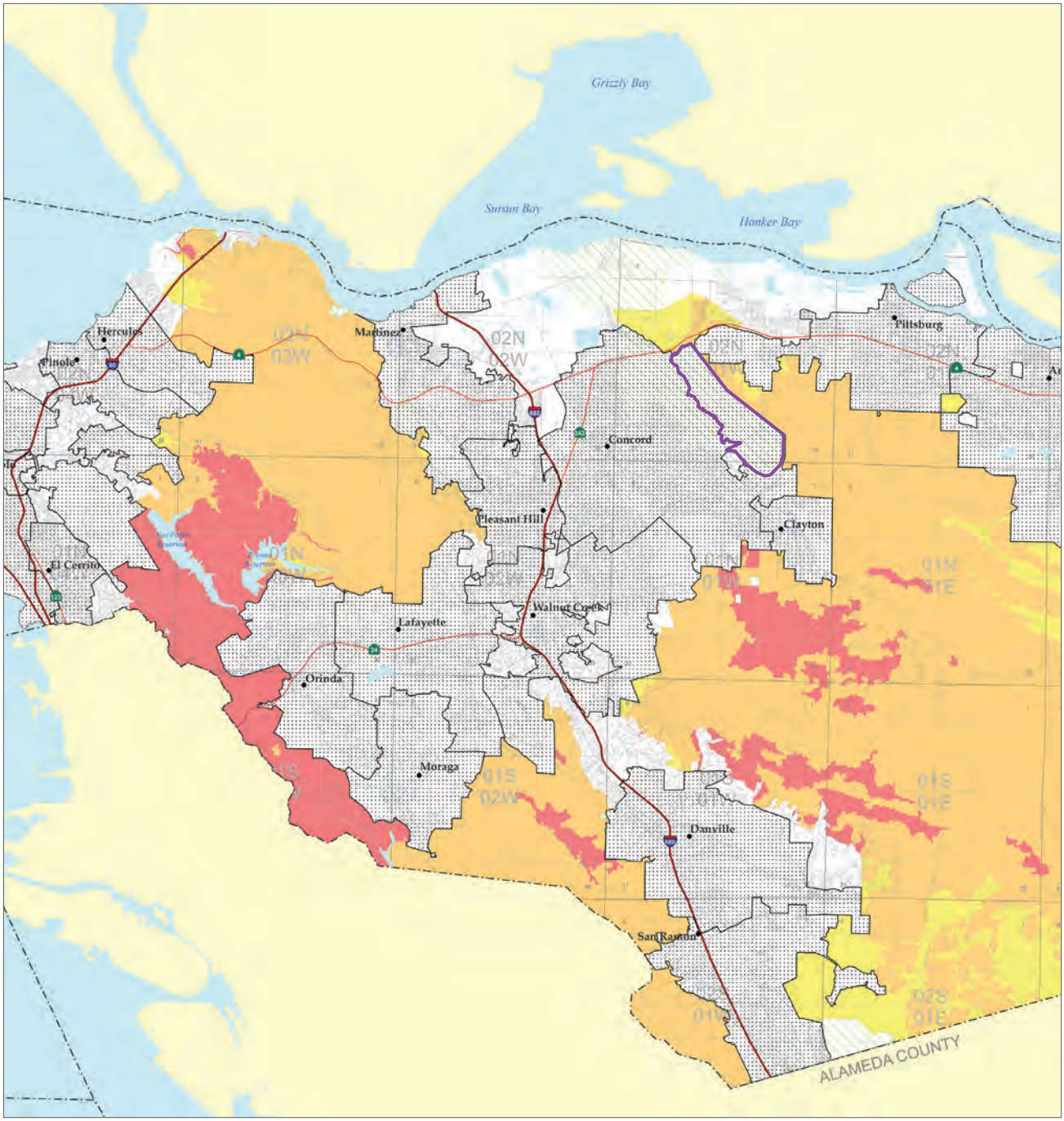
[33] Association of Bay Area Governments and Metropolitan Transportation Commission, 2018, White Paper: Bay Area Wildland Urban Interface Review of Risks, Plans, and Strategies, page 7; and Contra Costa County, 2018, Contra Costa County Hazard Mitigation Plan, page 13-1.

[34] Contra Costa County, 2018, Contra Costa County Hazard Mitigation Plan, page 13-1.



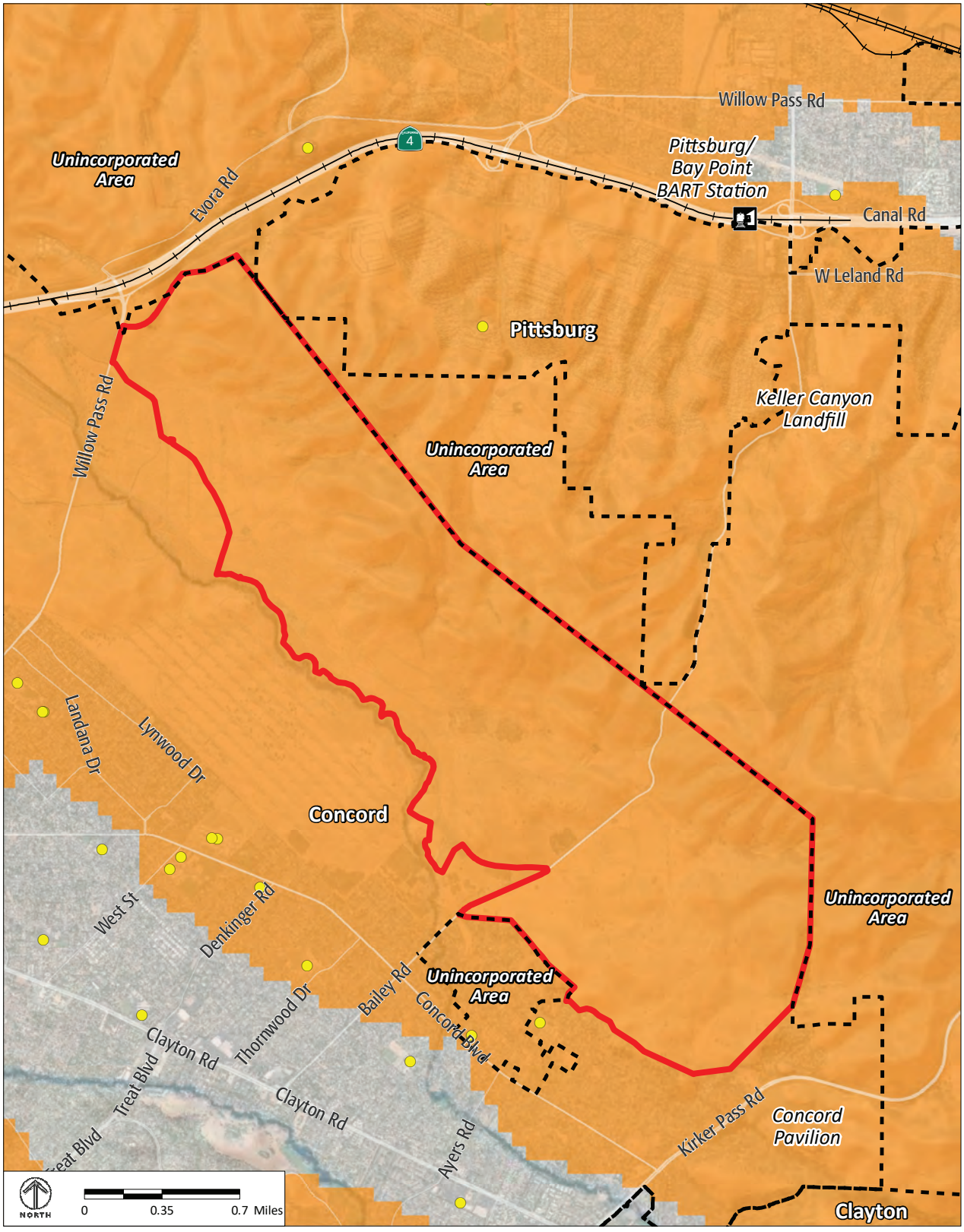
Source: CAL FIRE, 2009.

Figure 4.16-2
CAL FIRE Fire Hazard Severity Zone Map within the LRA, Contra Costa County



Source: CAL FIRE, 2007.

Figure 4.16-3
CAL FIRE Fire Hazard Severity Zone Map within the SRA, Contra Costa County



Source: PlaceWorks, 2016; CalFIRE, 2019; ESRI 2015

Project Site
Wildland Urban Interface
City Limit
Schools
BART Station
Railway

Figure 4.16-4
Wildland Urban Interface