6

Biological Resources

This chapter provides information on biological resources in the Project Area, including a presentation of federal, state, and local laws, policies, and regulations that influence protection of biological resources. The chapter identifies impacts on biological resources that may result from site grading and construction and habitat conversion, reduction or elimination. This chapter also identifies mitigation measures to avoid, minimize, or compensate for potentially significant impacts that may result from the proposed project.

Information contained in this chapter of the Draft EIR is derived from the following primary sources:

- Wetlands Research Associates, Inc. (WRA), *Special Status Species Report of the Johnson Property*, March 2004 (**Appendix 6A**);
- WRA, Inc., Habitat Mitigation Monitoring Plan, Sid Commons and Petaluma River Terrace Project, June 2016 (**Appendix 6B**);
- Duckles, Becky, Landscape Consultant and Arborist, *Oak Creek II Tree Inventory and Evaluation*, December 2003, updated September 15, 2004; and *Sid Commons Tree Removal & Mitigation Calculations*, May 2016 and latest update August 19, 2016 (**Appendix 6C**);
- WRA, Inc., Vegetation Mapping of the Project Site, March 2009;
- WRA Inc., Environmental Communities Mapping of the Site, June 2009;
- US Department of the Army, SF District, US Army Corps of Engineers, letter to WRA regarding confirmation of Corps jurisdiction, File # 2004-25571N, January 2013;
- Petaluma River Access and Enhancement Plan, adopted by the City of Petaluma May 1996.

Existing Conditions

Vegetation Cover

The vegetation cover and biological communities on the Project site (see **Figure 6-1**) consist of predominantly non-native grassland with scattered trees in the upland portion, and relatively dense riparian woodland vegetation along the Petaluma River. Some seasonal wetlands have developed within the non-native grassland areas, probably because of previous grading activities. Further discussion of the vegetation types within the Project site is provided below, and tabulated in **Table 6-1**.

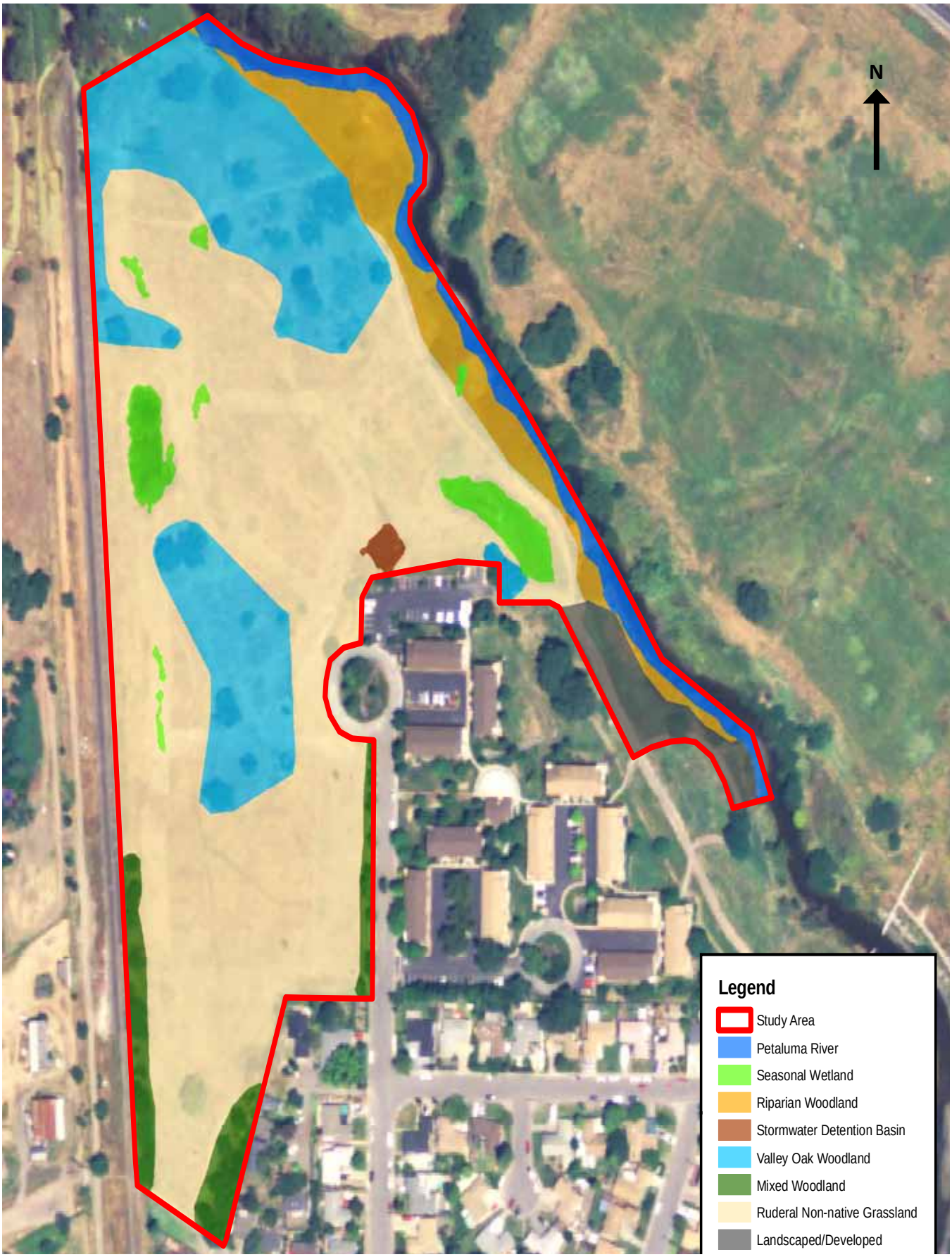

Figure 6-1
Biological Communities in the Project Site

Source: WRA, June 2009

Non-Native Grassland

Non-native grasslands cover much (approximately 10.6 acres) of the upland portion of the Project site. The non-native grassland is dominated by annual species such as wild oat (*Avena barbata*), Italian ryegrass (*Lolium multiflorum*), ripgut brome (B*romus diandrus*), soft chess (*Bromus hordeaceus*), wild radish (*Raphanus sativa*), vetch (*Vicia sativa*), and black mustard (*Brassica nigra.).* Low-lying areas within the grassland contain more moisture-tolerant species such as Mediterranean barley (*Hordeum marinum*), rabbitsfoot grass (*Polypogon mospeliensis*), and pepperweed (*Lepidium latifolium*).

Riparian Woodland

Riparian woodland vegetation occurs along the Petaluma River and extends approximately 50 to 100 feet from the bank onto the adjacent floodplain terrace, covering approximately 1.6 acres of the site. The vegetation consists primarily of thickets of willow (*Salix* sp.), blackberry (*Rubus armeniacus*.), and teasel (*Dipsacus fullonum*) in almost impenetrable swaths along the riverbank.

Valley Oak Woodland

Valley Oak Woodland habitat is widely scattered across the site and is generally dominated by Valley Oaks (*Quercus lobata*). This habitat type occurs in the central portion of the Project site as an isolated and interspersed grassland/woodland, as well as along the Project site boundaries, and covers approximately 4.6 acres of the Project site. The habitat type is also scattered throughout the area proximate to the River and top of bank, with some relatively large specimens clustered in the northern portion of the site, and a smaller grouping at the south end of the River frontage (see Figure 6-1 and **Figure 6-2**).

Mixed Woodland

A variety of mixed woodland tree species occurs along several portions of the Project boundaries in the southerly portion of the site, in total covering approximately 0.80 acres. These mixed woodlands include a row of trees along the SMART railroad track alignment comprised primarily of Valley Oak, Coast Live Oak (*Quercus agrifolia*) and Monterrey Cypress (*Cupresses macrocarpa*). Another stretch of mixed woodlands occurs along the Project site's open frontage onto Graylawn Avenue, comprised primarily of Coast Redwoods (*Sequoia sempervirens*). A third area of mixed woodlands exists in the Project site's southerly corner behind the existing homes along Bernice Court. This mixed woodland area consists primarily of Valley Oak and Coast Live Oak, interspersed with Bailey Acacia (*Acacia Baileyana*), Black Walnut (*Juglans sp.*) and other individual tree species.

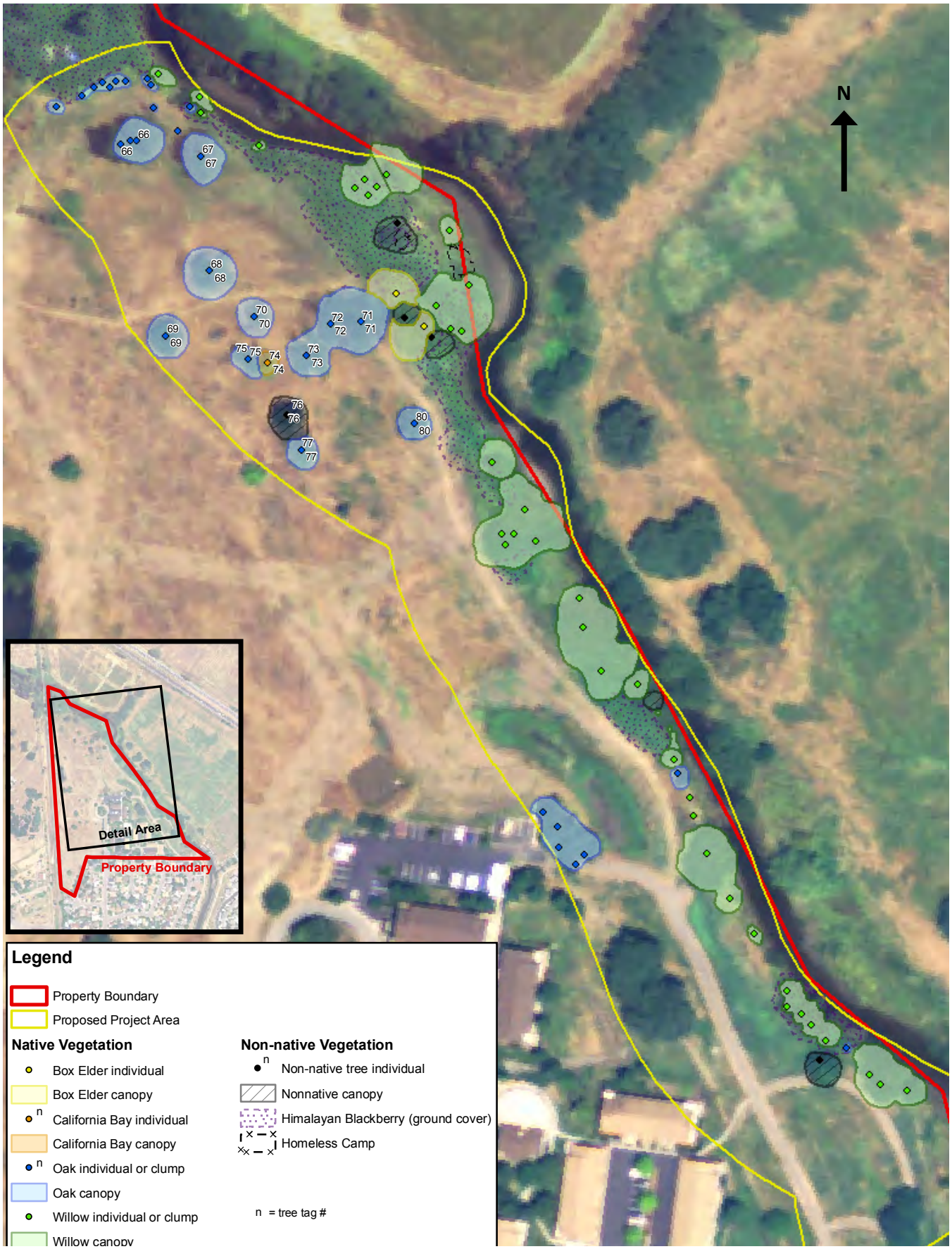

Figure 6-2
Riparian Woodland Vegetation along the Petaluma River

Source: WRA, June 2009

Seasonal Wetland

Eight separate seasonal wetland areas, in total comprising approximately 0.62 acres, were identified on the site during a wetlands assessment conducted by WRA in February, 2012 and confirmed by the US Army Corps of Engineers in January 2013 (see **Figure 6-3**). These wetland areas are primarily comprised of depressions apparently created when soil was excavated from these areas and used for prior construction of the off-site Oak Creek Apartments project. Some of these depressions contain typical wetland-associated vegetation, including spike rush (*Eleocharis* sp.); peppergrass (*Lepidium latifolium*), rabbitsfoot grass (*Polypogon monspeliensis*), curly dock (*Rumex crispus*); cocklebur (*Xanthium strumarium*), and Italian ryegrass (*Lolium multiflorum*). The wetland vegetation is dominated by non-native grasses and herbs, with native species typically not represented as dominant species. The most frequently observed species included Mediterranean barley, Italian rye grass, and fiddle dock. The functions and values of the seasonal wetlands rate low to moderate. The seasonal wetlands are dry most of the year and subject to discing as part of non-native grassland fire control, which reduces their value to both aquatic and terrestrial wildlife species.

Petaluma River

The Petaluma River flows along the northerly boundary of the Project site. The portion of the River that lies below the ordinary high-water line is defined as "'waters of the U.S." under USACE jurisdiction, and comprises nearly 1 acre of the Project site. According to the Petaluma River Enhancement and Access Plan (see **Figure 6-4**), this reach of the River is primarily freshwater habitat, with the transition to more brackish or fresh/brackish habitat that is tidally influenced with higher salinity levels generally occurring immediately down-river of the Project site, at the confluence with Lynch Creek. That fresh/brackish habitat continues downstream to the vicinity of Washington St, where a second transition occurs to brackish, tidally influenced habitat. The aquatic habitat within the bed and banks of this stretch of the Petaluma River is characterized by shallow waters with a sand-mud bottom. A minor amount of woody debris is deposited within the shallow stream sections. The edges of the riverbank are steeply sided, and the channel is incised.

Detention Basin

A small (less than 0.1-acre) man-made detention basin is located within the area immediately northwest of the existing Oak Creek Apartments. This detention basin is not subject to U.S. Army Corps of Engineers' regulatory authority, based on its Jurisdictional Determination dated December 31, 2012.

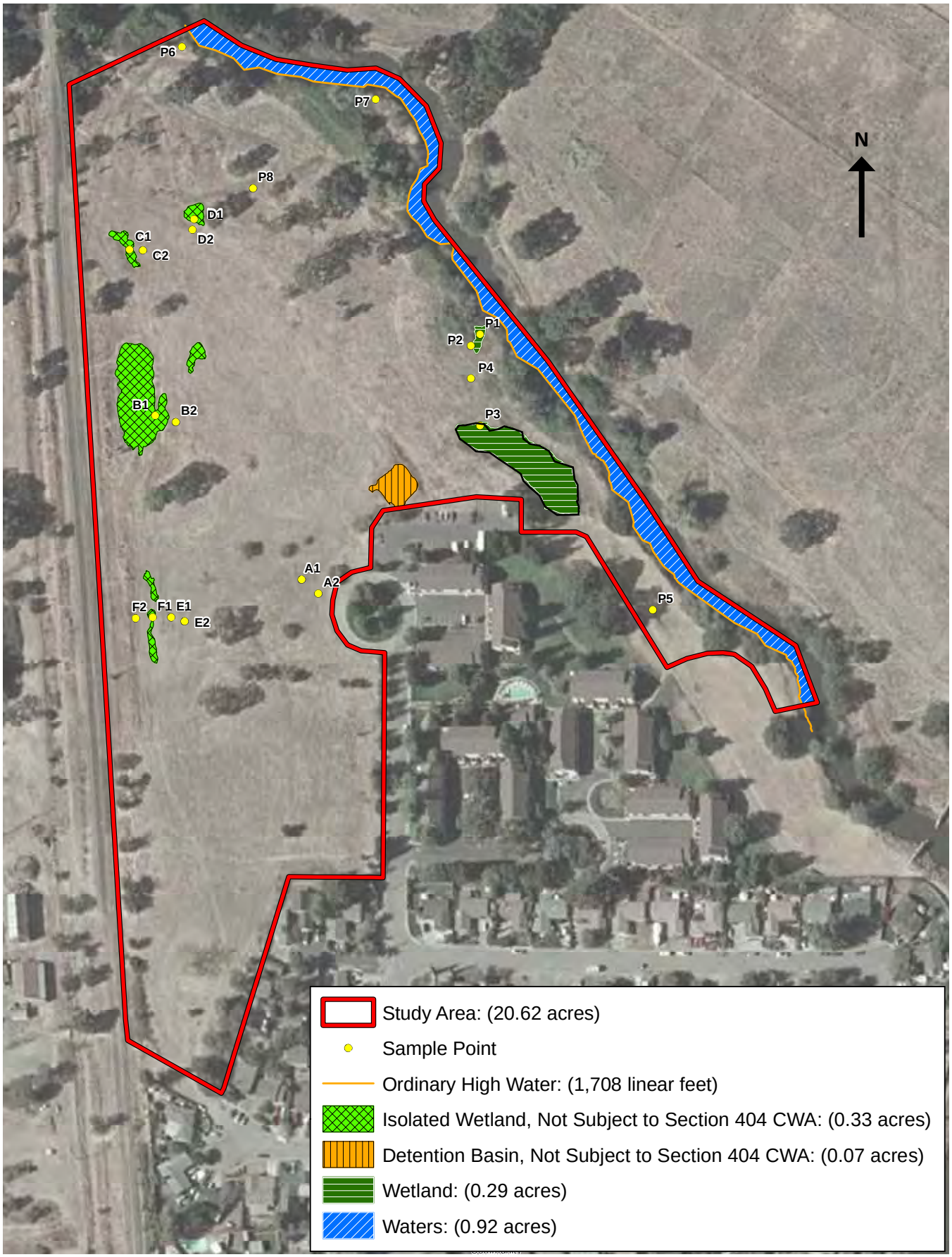

Figure 6-3
Wetlands Delineation / Waters of the US

Source: WRA, February, 2012 and as modified based on USACE Determination

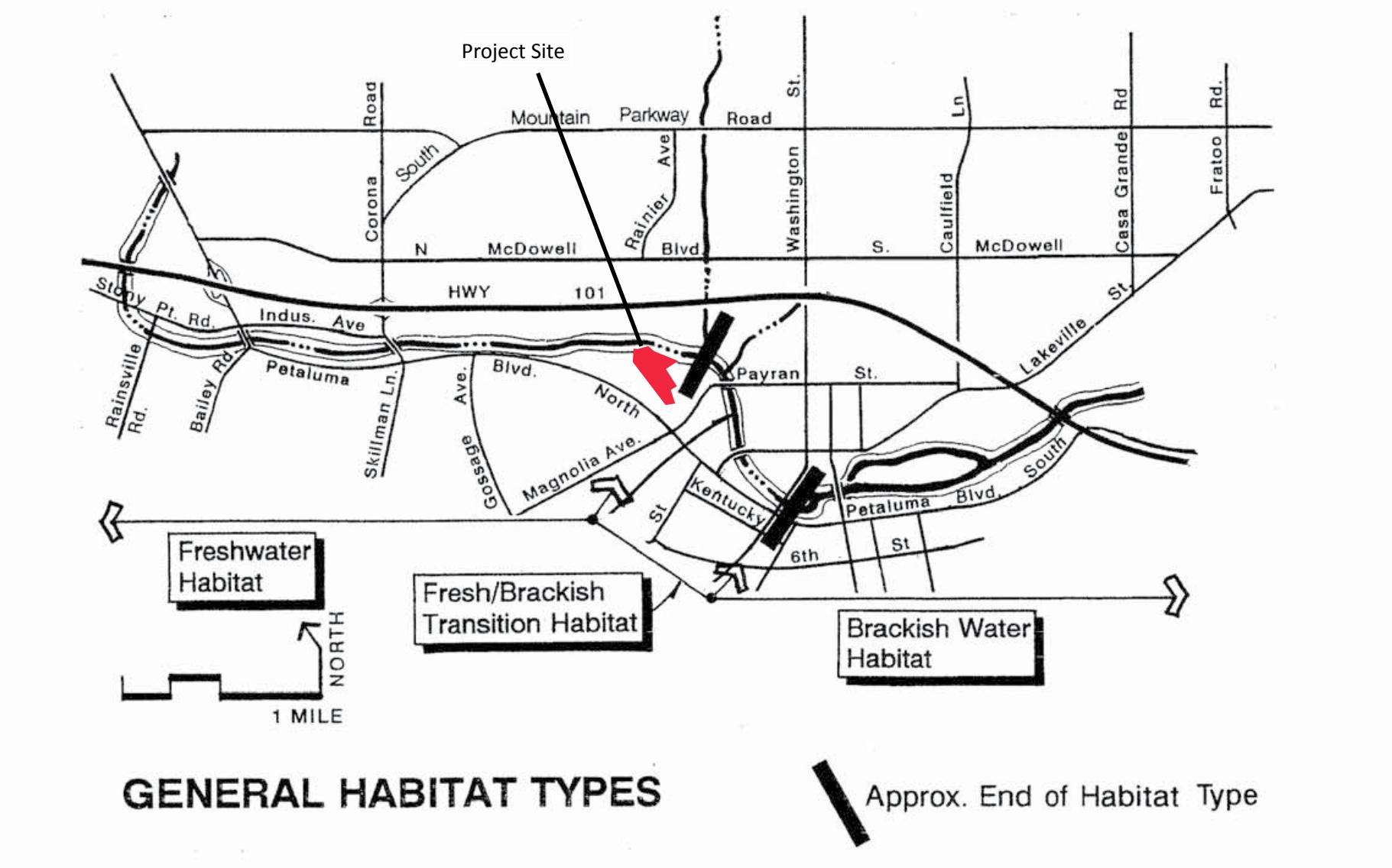

Figure 6-4
Petaluma River Aquatic Habitat Characteristics

Source: City of Petaluma, Petaluma River Access and Enhancement Plan, page 45

Table 6-1: Habitat Types within the Project Site

Habitat Type	Acres (approx.)
Non-Native Grassland	10.58
Valley Oak Woodland	4.66
Riparian Woodland	1.92
Mixed Woodland	0.80
Seasonal Wetlands	0.62
Petaluma River (waters of the US)	0.92
Detention Basin	0.07
Total	**19.57**

Source: WRA Inc., Environmental Communities Mapping of the Site, June 2009

Common Wildlife and Fish

The overall quality of wildlife habitat within the Project site is compromised due to the site's proximity to other existing development and the density of non-native vegetation. However, the site does provide some value to wildlife species and provides habitat functions by offering wildlife species refuge from urban development. Numerous wildlife species have been observed throughout the Project site and its vicinity. Many different species of birds have been seen flying or foraging in the Project site, including a red-shoulder hawk. Other observed wildlife includes turkey hens and chicks, northern mockingbird, acorn woodpecker, turkey vulture, and barn swallow. Other observed wildlife species includes jackrabbit and multiple burrow complexes.

Common fish species that are expected to inhabit or pass through the tidally influenced streams of the Petaluma River watershed include threadfin shad, Sacramento blackfish, fathead minnow, western mosquitofish, three-spine stickleback, green sunfish and prickly sculpin. [1]

Special-Status Species

Special-status species are plants and animals legally protected under state and federal endangered species acts or other regulations, or those species that the scientific community considers sufficiently rare to qualify for such listing. Special-status plants and animals are species in the following categories:

- Species listed, proposed for listing, or candidates for listing as threatened or endangered by the U.S. Fish and Wildlife Service (USFWS) under the federal Endangered Species Act (ESA);
- Species listed or proposed for listing by the California Department of Fish and Wildlife (CDFW) as rare, threatened or endangered under the California Endangered Species Act (CESA);

[1] Leidy, 2007

- Animals designated as "species of special concern" by the CDFW;
- Plants with a Rare Plant Rank of 1A, 1B or 2 as designated by the California Native Plant Society (CNPS);"[2]
- Birds protected under the Migratory Bird Treaty Act and California Fish and Game Code §3503, 2513, and 3800; and
- Animals designated as Fully Protected in the California Fish and Game Code.[3]

Appendix 6A provides a comprehensive listing of all special-status plants and animals, respectively, with an evaluation of their potential to occur on or near the Project site. The California Natural Diversity Database (CNDDB) has no records of special status plants or animals occurring on the upland portion of the Project site, but the riparian woodland and seasonal wetland areas along the riverbank provide potentially suitable habitat for some of the species evaluated.

Special Status Plants

No special status plants have a moderate or high potential to occur on the Project site. This determination was based on the habitat types present on the site, the known habitat requirements for those special status plants potentially occurring in the general area, and the results of previous surveys of the property.[4] Furthermore, the highly disturbed nature of the site would indicate that none are likely to be present.

Special Status Animals

Several special status animals that have a moderate to high potential for occurrence on the Project site are described below.

Special Status Birds

Based on existing habitat conditions, there is a moderate to high potential of occurrence for several special status bird species to occur in the Project area.

- White-tailed kite (*Elanus leucurus*) is a CDFW Fully Protected species associated with annual grasslands, scrub habitats, wet meadows, and emergent wetlands throughout the lower elevations of California. Nesting generally occurs in shrubs or small trees. Potential nesting habitat is present in the trees on the property, and kites likely forage over the grassy areas of the site.
- Allen's hummingbird (*Selasphorus sasin*) is a USFWS Bird Species of Conservation Concern and a CDFW Species of Special Concern. This hummingbird is primarily a summer resident in the San Francisco Bay region. Breeding occurs in a variety of habitat types, but especially in riparian, oak woodland, and coastal scrub communities. Allen's hummingbirds feed on nectar from a variety of herbaceous and woody flowering plants, and they also eat small insects and spiders. Potential nesting habitat is present in the trees on the property, and the hummingbird likely forages within the on-site riparian areas.

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[2] California Native Plant Society. 2010. *Inventory of Rare and Endangered Plants of California (Eighth Edition).* Online Inventory at http://www.rareplants.cnps.org/. Ranks 1B and 2.

[3] California Fish and Game Code, Section 3511 (birds), Section 4700 (mammals), and Section 5050 (amphibians and reptiles).

[4] WRA 2004.

- Loggerhead shrike (*Lanius ludovicianus*) is a USFWS Bird Species of Conservation Concern and a CDFW Species of Special Concern. Loggerhead shrike is a common resident and winter visitor in lowlands and foothills throughout California. It prefers open habitats with scattered trees, shrubs, posts, fences, utility lines or other perches. Nests are usually built on a stable branch in a densely foliaged shrub or small tree and are usually well concealed. Suitable foraging and breeding habitat is present at the Project site.
- Salt marsh common yellowthroat (*Geothlypis trichas sinuosa*) is a USFWS Bird Species of Conservation Concern. This subspecies of the common yellowthroat is found in freshwater marshes, coastal swales, riparian thickets, brackish marshes, and saltwater marshes. Their breeding range extends from Tomales Bay in the north, Carquinez Strait to the east, and Santa Cruz County to the south. This species requires thick, continuous cover such as tall grasses, tule patches, or riparian vegetation down to the water surface for foraging and prefers willows for nesting.
- California Ridgeway's rail (*Rallus longirostris obsoletus*) is a federally listed endangered species and a fully protected species under the CDFW. This species is found in salt marsh habitat dominated by pickleweed and cordgrass. Although this species is not present at the Project site due to lack of tidal wetlands with emergent vegetation, the tidal brackish marsh habitat adjacent to the Petaluma River may provide support for rails.[5]
- California black rail (*laterallus jamaicensis coturniculus*) is a CDFW Fully Protected species. This species breeds in fresh, brackish, and tidal salt marsh habitat. Although this species is not present at the Project site due to lack of tidal wetlands with emergent vegetation, the tidal brackish marsh habitat adjacent to the Petaluma River may provide support for rails.[6]

Other bird species that may be present on the Project site include the yellow-billed cuckoo (a state endangered species and a federal threatened species), and several other state Species of Special Concern, including long-eared owl, Purple martin, yellow warbler, yellow-breasted chat, yellow-billed cuckoo, and Northern harrier, which could nest on the Project site in the grasslands.

Special Status Fish Species

Three fish species are known or are suspected to occur in the reach of the Petaluma River that runs along the northeastern edge of the Project site. The CNDDB has a record of Sacramento splittail (*Pogonichthys macrolepidotus*) in this reach, and this portion of the River is also included in the designation of Critical Habitat for Central California Coast ESU steelhead trout (*Oncorhynchus mykiss irideus*). Chinook salmon (*Oncorhynchus tshawytscha*) may also travel through this reach of the river at some point in their lifecycle.

Special Status Reptile & Amphibian Species

While not likely to occur at the Project site, the following two species bare discussion:

California Red-Legged Frog

The California red-legged frog (CRLF*, Rana draytonii*) is a federally listed Threatened species and state listed Species of Special Concern, and has a low to moderate potential of occurring on the Project site.

[5] Field visit with CDFW, 2016.

[6] Ibid.

This species is dependent on suitable aquatic, estivation, and upland habitat. During periods of wet weather, starting with the first rainfall in late fall, red-legged frogs disperse away from their estivation sites to seek suitable breeding habitat. Aquatic and breeding habitat is characterized by dense, shrubby, riparian vegetation and deep, still or slow-moving water. Estivation habitat consists of small mammal burrows, moist leaf litter, incised stream channels, and large cracks in the bottom of dried ponds.

The reach of the Petaluma River at the Project site is at or near the transition point where freshwater mixes with more the brackish and tidally influenced flows. The salinity levels in the Petaluma River at the Project site may render this reach of the River unsuitable aquatic and breeding habitat for CRLF. The on-site seasonal wetlands may also not hold water long enough to provide suitable aquatic habitat for this species. There are recorded occurrences of the CRLF within a three-mile radius of the site (CNDDB 2013), but there are substantial barriers between those recorded locations and the Project site. Project specific review notes no suitable breeding habitat on the Project site and non-native predators within the River (WRA 2004). Although CRLF are not expected to occur in the Project site on any regular basis, or for any extended period of time due to the lack of suitable habitat on-site and marginal dispersal habitat, the possibility cannot be ruled out that CRLF may move through the Project area during grading operations.[7] For these reasons, there is only a low to moderate potential that CRLF could use the site.

Western Pond Turtle

Western pond turtle (WPT, *Actinemys marmorata*) is a state Species of Special Concern. It has been documented to occur in the Petaluma River system less than three miles upstream of the Project site (CNDDB 2013). The portion of the river on the Project site has low potential for occurrence of western pond turtle as it does not present suitable aquatic habitat, but turtles may occasionally nest near the Project boundary (WRA, 2004).

Wetlands / Waters of the US

A wetland assessment was conducted by Wetlands Research Associates (WRA) in March and April 2012 to determine if wetlands occur on the Project site. The federal government defines wetlands as habitats that have three important characteristics: hydrophytic vegetation, hydric soils, and wetlands hydrology. WRA identified eight seasonal wetlands on the site, six of which are isolated seasonal wetlands and two of which are larger wetlands adjacent to the Petaluma River. The isolated seasonal wetlands are primarily depressions that may have been created when soil was excavated from these areas and used for prior construction of the Oak Creek Apartments project. Some of these depressions have developed wetland-associated vegetation over time, including spike rush (*Eleocharis* sp.); peppergrass (*Lepidium latifolium*), rabbitsfoot grass (*Polypogon monspeliensis*), curly dock (*Rumex crispus*); and Italian ryegrass (*Lolium multiflorum*). The location of these seasonal wetlands is shown in Figure 6-3.

According to the US Army Corps of Engineers (USACE) certification of the Wetland Delineation Map for the Project site (December 12, 2012), each of these wetland areas are within the extent and location of USACE jurisdiction. The jurisdictional delineation is based on the conditions of the site as verified during the field investigation of September 26, 2012, and the jurisdictional delineation does not expire until five (5) years from that date, unless new information or a change in field conditions warrants a revision to the delineation map prior to the expiration date.

[7] City of Petaluma, Rainier Cross Town Connector Draft EIR, page 4.3-23

The reach of Petaluma River within the Project site is a jurisdictional "water of the U.S" (see also Figure 6-4). The jurisdictional extent of the River covers nearly 1 acre within the Project site, defined by the ordinary high-water mark which contains no wetland vegetation.

Both the seasonal wetlands and the River are considered "waters of the State", also regulated by the State Water Resources Control Board pursuant to the Porter-Cologne Water Quality Control Act (see further discussion, below).

Regulatory Framework

This section describes the local, state, and federal plans, policies, and laws that are relevant to biological resources and that are applicable to the Project.

Federal Government

Federal Endangered Species Act

The federal Endangered Species Act (ESA) and subsequent amendments provide guidance for the protection and conservation of federally listed endangered and threatened species, and the ecosystems upon which they depend. Section 9 of the federal ESA prohibits the taking of a federally listed species. Taking is defined by the federal ESA to mean "harass, harm, pursue, hunt, shoot, wound, kill, trap, capture, or collect, or attempt to engage in any such conduct." Harm specifically includes significant habitat modification or degradation of habitat of a listed species. Critical habitat is a term defined and used in the federal ESA as a specific geographic area that contains features essential for the conservation of a threatened or endangered species and that may require special management and protection. Section 7 of the federal ESA requires federal agencies to ensure that actions they authorize, fund or carry out are not likely to jeopardize the continued existence of threatened or endangered species, or result in the destruction or adverse modification of critical habitat for these species. The U.S. Fish and Wildlife Service (USFWS) regulates those activities that may result in take of individuals of threatened or endangered species. Section 10 of the ESA provides for the issuance of incidental take permits, which permit limited take of listed species where the take is incidental to otherwise lawful activities conducted by private non-Federal entities, provided that the permit holder prepares a Habitat Conservation Plan that details strategies to avoid, minimize, or compensate take. Candidates and species proposed for listing also receive certain protections from federal agencies during environmental review.

Clean Water Act

The Clean Water Act (CWA) provides guidance for the restoration and maintenance of the chemical, physical, and biological integrity of the nation's waters. The U.S. Army Corps of Engineers (USACE) has jurisdiction over waters of the U.S. under the Clean Water Act, and over navigable waters of the U.S. under Section 10 of the Rivers and Harbors Act of 1899 (see below).

Section 401 of the CWA requires that discharges of dredged or fill material into waters of the United States not violate effluent limitations or water quality standards established by the states. Section 402 of the CWA prohibits the discharge of any pollution into surface waters of the United States unless the discharge is permitted under the National Pollution Discharge Elimination System (NPDES) program (Title 33 of the United States Code Sections 1311, 1342). In California, Section 402 permitting authority has been delegated to the State Water Resources Control Board (WRCB) and is administered by the Regional Water Quality Control Boards (RWQCB).

Section 404 establishes a permit program, administered by the USACE, that regulates the discharge of dredged or fill material into waters of the United States, including wetlands. All proposed discharges of dredged or fill material occurring below the plane of ordinary high water in non-tidal waters of the United States and within the lateral extent of wetlands adjacent to these waters require USACE authorization and the issuance of a permit. Waters of the United States generally include the territorial seas, all navigable waters, including waters subject to the ebb and flow of the tide, non-tidal interstate and intrastate waters and their tributary waters, including lakes, ponds, rivers, streams, intermittent streams, and adjacent wetlands, the use, degradation, or destruction of which could affect interstate or foreign commerce. The 404 permit guidelines allow the discharge of dredged or fill material into the aquatic system only if there is no practicable alternative that would have less adverse impacts.

A Water Quality Certification pursuant to Section 401 of the Clean Water Act is required for federal Section 404 permit actions. The USACE may not authorize a project under Section 404 of the CWA until the permit applicant has obtained a certification of compliance with state water quality standards (i.e., a water quality certification) from the Regional Water Quality Control Board (RWQCB).

Rivers and Harbors Act

All proposed structures and work, including excavation, dredging, and discharges of dredged or fill material, occurring below the plane of mean high water in tidal waters of the United States; in former diked bay lands currently below mean high water; outside the limits of mean high water but affecting the navigable capacity of tidal waters; or below the plane of ordinary high water in non-tidal waters designated as navigable waters of the United States, typically require USACE authorization, and the issuance of a permit under Section 10 of the Rivers and Harbors Act of 1899, as amended (33 U.S.C. Section 403 et seq.). Navigable waters of the United States generally include all waters subject to the ebb and flow of the tide; and/or all waters presently used, or have been used in the past, or may be susceptible for future use to transport interstate or foreign commerce.

Federal Migratory Bird Treaty Act (MBTA)

The Federal Migratory Bird Treaty Act (MBTA, 16 U.S.C., Sec. 703) prohibits any person to "pursue, hunt, take, capture, kill, attempt to take, capture or kill, possess, offer for sale, sell, offer to purchase, purchase, deliver for shipment, ship, cause to be shipped, deliver for transportation, transport, cause to be transported, carry, or cause to be carried by any means whatever, receive for shipment, transportation or carriage, or export, at any time, or in any manner, any migratory bird, included in the terms of this Convention ... for the protection of migratory birds ... or any part, nest, or egg of any such bird."[8]

The list of migratory birds includes almost every native bird in the United States. This law also extends to nests, and eggs. It is a violation of the MBTA to directly kill or destroy an active nest of any bird species. The MBTA is typically applied on projects to prevent injury or death of nesting birds and their chicks.

[8] Migratory Bird Treaty Act of 1918 (16 U.S.C. 703-712; Ch. 128; July 13,1918; 40 Stat. 755) as amended by Chapter 634; June 20,1936; 49 Stat. 1556; P.L. 86-732; September 8, 1960; 74 Stat. 866; P.L. 90-578; October 17,1968; 82 Stat. 1118; P.L. 91-135; December 5,1969; 83 Stat. 282; P.L. 93-300; June 1,1974; 88 Stat. 190; P.L. 95-616; November 8, 1978; 92 Stat. 3111; P.L. 99-645; November 10,1986; 100 Stat. 3590 and P.L. 105-312; October30, 1998; 112 Stat. 2956.

Fish and Wildlife Coordination Act (16 USC 661-666)

This Act applies to any federal action (such as an application for a USACE permit) where the waters of any stream or other body of water are impounded, diverted, deepened, or otherwise modified. The federal permitting agency is required to consult with the USFWS and the appropriate state wildlife agency. These agencies prepare reports and recommendations that document project effects on wildlife and identify measures that may be adopted to prevent loss or damage to wildlife resources. The term "wildlife" includes both animals and plants. Provisions of the Act are implemented through the Section 404 permit process.

Fish and Wildlife Conservation Act (16 U.S.C. 2901-2911)

This Act, passed in 1980, authorizes financial and technical assistance to the States for the development, revision, and implementation of conservation plans and programs for nongame fish and wildlife. The 1988 amendment to this Act mandates the U.S. Fish and Wildlife Service to "identify species, subspecies, and populations of all migratory nongame birds that, without additional conservation actions, are likely to become candidates for listing under the Endangered Species Act (ESA) of 1973." This led to the designation of Species of Conservation Concern.

Magnuson-Stevens Fishery Conservation and Management Act

The Fishery Conservation and Management Act (FCMA) of 1976 (16 U.S.C. 1801 et seq.) was amended in 1996 and renamed the Magnuson-Stevens Fishery Conservation Management Act. The amended portion addresses substantially reduced fish stocks that declined as a result of direct and indirect habitat loss. Major provisions of the FCMA requires national fishery conservation and management standards to provide for the sustained participation of fishery dependent communities; modifies operation of established Fishery Management Councils; mandates that the Secretary of Commerce shall take actions to identify overfished species and take action to rebuild those stocks; and mandates the Secretary of Commerce to promulgate guidelines for identification of essential fish habitat (EFH) by Fishery Management Councils. Other federal agencies are required to consult with the Secretary when actions they take impact designated essential fish habitat.

Executive Order 13112: Invasive Species

This order directs all federal agencies to prevent and control the spread of invasive plants and animals and to avoid direct or indirect impacts whenever there is a practicable alternative.

State of California

California Endangered Species Act

California Endangered Species Act (CESA) or Fish and Game Code 2050 et seq., establishes the policy of the State to conserve, protect, restore and enhance threatened or endangered species and their habitats. The CESA mandates that State agencies should not approve projects that would jeopardize the continued existence of threatened or endangered species if reasonable and prudent alternatives are available that would avoid jeopardy. CESA requires State lead agencies to consult with the CDFW to avoid jeopardy to threatened or endangered species. As an outcome of consultation, the CDFW is required to issue a written finding indicating if a project would jeopardize threatened or endangered species, and specifying reasonable and prudent alternatives that would avoid jeopardy. CESA provides for joint consultations when species are listed by both the State and federal governments.

State-listed rare, threatened, and endangered species are protected under provisions of CESA. Activities that may result in take of individuals (e.g., "hunt, pursue, catch, capture, or kill, or attempt to hunt, pursue, catch, capture, or kill") are regulated by the CDFW. CDFW has interpreted take to include the destruction of nesting and foraging habitat necessary to maintain viable breeding populations of relevant state threatened or endangered species.

California Fully Protected Species and Species of Special Concern

The classification of "fully protected" was the CDFW's initial effort to identify and provide additional protection to those animals that were rare or faced possible extinction. Lists were created for fish, amphibians and reptiles, birds, and mammals. Most of the species on these lists have subsequently been listed under CESA and/or the federal ESA. The Fish and Game Code sections (fish at §5515, amphibians and reptiles at §5050, birds at §3503 and §3511, and mammals at §4150 and §4700) dealing with "fully protected" species state that these species "…may not be taken or possessed at any time and no provision of this code or any other law shall be construed to authorize the issuance of permits or licenses to take any fully protected species," although take may be authorized for necessary scientific research. This language makes the "fully protected" designation the strongest and most restrictive regarding the take of these species. In 2003, the Code sections dealing with fully protected species were amended to allow the CDFW to authorize take resulting from recovery activities for state-listed species.

Species of special concern are broadly defined as animals not listed under the federal FESA or CESA, but which are nonetheless of concern to the CDFW because they are declining at a rate that could result in listing or because they historically occurred in low numbers and known threats to their persistence currently exist. This designation is intended to result in special consideration for these animals by the CDFW, land managers, consulting biologist, and others, and is intended to focus attention on the species to help avert the need for costly listing under federal ESA and CESA and cumbersome recovery efforts that might ultimately be required. This designation also is intended to stimulate collection of additional information on the biology, distribution, and status of poorly known at-risk species, and focus research and management attention on them. Although these species generally have no special legal status, they are given special consideration under the CEQA during project review. A Species of Special Concern is a species, subspecies, or distinct population of an animal native to California that currently satisfies one or more of the following (not necessarily mutually exclusive) criteria:

- is extirpated from the State or, in the case of birds, in its primary seasonal or breeding role;
- meets the State definition of threatened or endangered but has not formally been listed;
- is experiencing, or formerly experienced, serious (noncyclical) population declines or range retractions (not reversed) that, if continued or resumed, could qualify it for State threatened or endangered status; and
- has naturally small populations exhibiting high susceptibility to risk from any factor(s), which if realized, could lead to declines that would qualify it for State threatened or endangered status.

Species of special concern do not receive protection under the CESA or any section of the California Fish and Game Code, and do not necessarily meet CEQA Guidelines Section 15380 criteria as rare, threatened, endangered, or of other public concern. Like federal species of concern, the determination of significance for California species of special concern must be made on a case-by-case basis.

California Fish and Game Code – Protection of Raptors

Birds of prey are protected in California under the California Fish and Game Code, section 3503.5. Under section 3503.5, it is unlawful to take, possess or destroy any raptors (including owls), or to take, possess, or destroy the nest or eggs of raptors or owls. The CDFW considers a disturbance that causes nest abandonment or loss of reproductive effort as a "taking." Construction disturbance during the breeding season can result in the incidental loss of fertile eggs or nestlings or otherwise lead to nest abandonment. Any losses of fertile eggs or nesting raptors or any activities resulting in nest abandonment are significant impacts.

Porter-Cologne Water Quality Control Act

The Porter-Cologne Water Quality Control Act, in part, implements the federal CWA to provide a mechanism for protecting the quality of the state's waters through the State Water Resources Control Board (SWRCB) and the nine Regional Water Quality Control Boards (RWQCBs). The SWRCB and the San Francisco Bay RWQCB have taken the position that the Porter-Cologne Act and the San Francisco Bay Basin Plan developed pursuant to the Act provide independent authority to regulate discharge of fill material to wetlands outside the jurisdiction of the Corps.

Waters of the State are defined by the Porter-Cologne Act as "any surface water or groundwater, including saline waters, within the boundaries of the state." The RWQCB protects all waters in its regulatory scope, but has special responsibility for isolated wetlands and headwaters. These waterbodies have high resource value, are vulnerable to filling, and may not be regulated by other programs, such as Section 404 of the CWA. Waters of the State are regulated by the RWQCB under the State Water Quality Certification Program, which regulates discharges of dredged and fill material under Section 401 of the CWA and the Porter-Cologne Water Quality Control Act. Projects that require a USACE permit, or fall under other federal jurisdiction, and have the potential to impact Waters of the State are required to comply with the terms of the Water Quality Certification Program. If a proposed project does not require a federal license or permit, but does involve activities that may result in a discharge of harmful substances to waters of the State, the RWQCB has the option to regulate such activities under its State authority in the form of Waste Discharge Requirements or Certification of Waste Discharge Requirements.

Sections 1601-1606 of the Fish and Game Code

Under these sections of the Fish and Game Code, the project sponsor and other agencies are required to notify the CDFW prior to any project that would divert, obstruct, or change the natural flow, bed, channel, or bank of any river, stream, or lake. Preliminary notification and project review generally occurs during the environmental process. When an existing fish or wildlife resource may be substantially adversely affected, CDFW is required to propose reasonable project changes to protect the resource. These modifications are formalized in a Streambed Alteration Agreement that becomes part of the plans, specifications, and bid documents for the project.

Native Plant Protection Act (Fish and Game Code 1900-1913)

California's Native Plant Protection Act requires all State agencies to utilize their authority to carry out programs to conserve endangered and rare native plants. Provisions of the act prohibit the taking of listed plants from the wild and require notification of the CDFW at least 10 days in advance of any change in land use. This allows the CDFW to salvage listed plant species that would otherwise be destroyed. The project sponsor is required to conduct botanical inventories and consult with the CDFW

during project planning to comply with the provisions of this act and sections of CEQA that apply to rare or endangered plants.

California Oak Woodland Statute

In September 2004, State Bill 1334 was passed and added to the State Public Resources Code as Statute 21083.4, requiring all California cities and counties to determine in their CEQA documents whether a project in its jurisdiction may result in a conversion of oak woodlands that will have a significant effect on the environment. The California Fish and Game Code (Section 1361) defines oak woodland habitat as "an oak stand with a greater than 10 percent canopy cover or that may have historically supported greater than 10 percent canopy cover."

Sensitive Vegetation Communities

Sensitive vegetation communities are natural communities and habitats that are either unique, of relatively limited distribution in the region, or of particularly high wildlife value. These resources have been defined by federal, state, and local conservation plans, policies or regulations. The CDFW ranks sensitive communities as "threatened" or "very threatened" and keeps records of their occurrences in its CNDDB. Sensitive vegetation communities are also identified by CDFW on its List of California Natural Communities recognized by the CNDDB. Impacts on sensitive natural communities and habitats identified in local or regional plans, policies, regulations or by federal or state agencies must be considered and evaluated under the CEQA (CCR: Title 14, Div. 6, Chap. 3, Appendix G).

Local Regulations

Local policies and regulations applicable to biological resources in the Project site vicinity include the policies and ordinances of the City of Petaluma, including those General Plan 2025 policies related to biological resources, the policies and guidelines of the Petaluma River Access and Enhancement Plan (River Plan), and Petaluma ordinances and regulations intended to protect and provide for the replacement of protected trees. These local plans, policies and regulations are further described below.

General Plan 2025

The Petaluma General Plan 2025 includes numerous goals, policies and programs that provide for the protection and enhancement of biological and natural resources, including the following:

> **Policy 1-P-40**: An area shown as the Petaluma River Corridor (PRC), along the Petaluma River, shall be set aside for the creation of flood terraces where appropriate; preservation, expansion, and maintenance of flood storage capacity of the floodplain; habitat conservation; and public access.
>
> **Policy 1-P-46**: New development shall acknowledge, preserve, protect, and enhance the ecological and biological health and diversity of the Petaluma River.
>
> **Policy 1-P-49**: Preserve existing tree resources and add to the inventory and diversity of native/indigenous species.
>
> **Policy 2-P-37**: Use the Natural Environmental Element, Water Resources Element and the Petaluma River Access and Enhancement Plan to implement the greenway, create flood terraces, preserve flood storage capacity, protect habitat and enhance oak and riparian habitat and other open spaces along the river.
>
> **Policy 2-P-59**: Promote greater accessibility and views to Petaluma River through road extensions, bikeways, and trails, including:
>
> - Enhancing the ecological diversity of the riparian corridor.

- Requiring development to enhance the natural ecology along the river.

Policy 4-P-1: Protect and enhance the Petaluma River and its tributaries through a comprehensive river management strategy of the following programs:

a. Fully adopt and incorporate the Goals, Objectives, Policies and Programs of the Petaluma River Access and Enhancement Plan as an integral part of the General Plan 2025. Implement the Petaluma River Access and Enhancement Plan including expanded improvements identified through project specific environmental assessment.

b. Institute and maintain public access to and along the entire length (on one or both sides), of the river while ensuring that natural resources and river dependent industry are protected.

c. Require design review to address the relationship and stewardship of that project to the river or creek for any development on sites with frontage along the river and creeks.

d. Create setbacks for all tributaries to the Petaluma River extending a minimum of 50 feet outward from the top of each bank, with extended buffers where significant habitat areas, vernal pools, or wetlands exist. Development shall not occur within this setback, except as part of greenway enhancement (for example, trails and bikeways). Where there is degradation within the zone, restoration of the natural creek channels and riparian vegetation is mandatory at time of adjacent development.

e. Facilitate compliance with Phase II standards of the National Pollutant Discharge Elimination System (NPDES) to improve the water quality and aesthetics of the river and creeks.

f. Work with the State Lands Commission, State Department of Fish and Game, the Sonoma County Water Agency, and other jurisdictional agencies on preservation/enhancement of the Petaluma River as a component of reviewing major development along the River.

g. Expand the planting and retention of trees along the upper banks of the river and creeks to reduce ambient water temperature and shade out invasive, non-native species.

h. Develop a consistent design for site furniture, a way-finding system, and educational signage in the PRC and along the creeks and tributaries leading to it to heighten the recognition and value of the river and its ecosystem.

i. Utilize the Parks and Recreation, Water Resources & Conservation, Public Works departments, property owners (e.g. Landscape Assessment Districts) and/or other appropriate public agencies (e.g. Sonoma County Water Agency) to manage the long-term operations, maintenance responsibilities, and stormwater capacity associated with the river and tributary greenways.

j. Prohibit placement of impervious surfaces in the Floodway (i.e. Parking lots, roadways, etc.) with the exception of pathways and emergency access improvements.

k. Continue to implement, where appropriate, flood terrace improvements to reduce localized flooding in concert with habitat enhancement projects.

Policy 4-P-2: Conserve wildlife ecosystems and sensitive habitat areas in the following order of protection preference: 1) avoidance, 2) on-site mitigation, and 3) off-site mitigation.

Policy 4-P-3: Protect special status species and supporting habitats within Petaluma, including species that are State or federal listed as endangered, threatened, or rare.

a. As part of the development review process, site-specific biological resource assessments may be required to consider the impacts on riparian and aquatic resources and the habitats they provide for invertebrates, fish, amphibians, reptiles, birds, mammals, and plants. If development is located outside these ecologically sensitive regions, no site-specific assessment of biological resources may be necessary. Appropriate mitigation measures to reduce impacts to sensitive habitats and special

status species shall be imposed on a project-by-project basis according to Petaluma's environmental review process.

Petaluma River Access and Enhancement Plan

The Petaluma River Access and Enhancement Plan (the River Plan) adopted by the City in 1996 describes the community's vision for the Petaluma River, including riverfront uses, activities, and developments. A central feature of the River Plan is the integration of the natural and built environment, recognizing that development and public access along the river must be balanced with protection of the few remaining natural areas located along this corridor. Equal in priority are the goals and policies of the Surface Water portion of the Water Resources Element of the General Plan, which identifies the need to preserve an adequate setback from the River to accommodate peak storm flows and to create flood terracing upstream of the weir.

The Petaluma River Plan establishes, among other objectives, a comprehensive set of goals and policies for the mitigation of impacts on wetland habitats and their values, functionally related riparian areas, oak woodland, and other sensitive habitat. The following provides a short overview of the goals and objectives of the River Plan as they related to biological resources, as stated at Chapter 8.

GOAL I: Protect wetlands, related riparian areas, and oak woodland as valuable resources throughout the Petaluma River Watershed

a. Wetlands, riparian habitat, and oak woodlands are significant resources in the Petaluma area which should be protected, preserved, restored, and enhanced throughout the watershed.

b. Properties which contain natural resources and which are to be impacted by activities occurring on-site or off-site which have the potential to affect habitat acreage and values, shall seek to: (1) avoid all impacts on the significantly valuable habitat; (2) where avoidance is not feasible, minimize impacts on the resource; and (3) where impacts are inevitable and all feasible project alternatives have been examined, the impact may be mitigated by the creation, restoration, and enhancement of compensatory habitat acreage and/or values within appropriate places in the greenway.

c. If avoidance of impacts is not feasible, mitigate the loss of acreage and value for all significant impacts to these resources, subject to the provisions of CEQA and the Clean Water Act.

d. The City shall require wetland mitigation which compensates for the loss of wetland acreage and wetland habitat values throughout all areas over which it has jurisdiction. Impacts on wetlands should be mitigated such that there is no net loss of wetland acreage and values.

e. Where significant high-quality riparian or tidal marsh areas and oak woodlands are impacted, compensatory mitigation shall be required for losses for both acreage and value.

f. Mitigation measures implemented for one specific impact shall not be counted as a mitigation for other unrelated impacts.

GOAL II: Allow mitigation of natural resource impacts, where necessary, through use of the greenway

a. The use of the river greenway[9] shall be considered acceptable mitigation site(s) for natural resource impacts when all other feasible efforts of avoiding the impact have been exhausted. At a minimum, prior to the off-site use of the greenway as a mitigation site, it must be demonstrated that no

[9] Where the River Plan uses the term "greenway", this document uses the more descriptive term "Petaluma River Plan Corridor" for the same area.

feasible, less damaging design alternatives to the proposed project exist and that on-site compensation is determined to be infeasible, impracticable, or unacceptable to the City.

b. All activities which seek to mitigate impacts within the greenway shall compensate for acreage and values at ratios which reflect the significance and quality of the impacted resources. It may also be necessary to establish mitigation areas within the greenway at a ratio greater than 1:1 for the acreage lost in order to compensate for lost values through time (temporal losses), unless the establishment is completed successfully in advance of the impacts.

c. Emphasis shall be given to establishing mitigation sites in areas where opportunities exist to protect existing habitat, establish, enhance, or protect the linkage of wildlife corridors, or enhance existing riparian and wetland habitat, through consolidation and expansion of habitat quantity and diversity, and separation from intensive urban uses.

d. The mitigations must conform to the River Plan.

GOAL III: Provide within the greenway the opportunity for the mitigation of impacts to rare, threatened and endangered species and/or their habitat in the Petaluma River Watershed.

a. Properties which contain sensitive plant, animal, or habitat resources shall seek to: (1) avoid all impacts on the species and its habitat; (2) where avoidance is not feasible, to minimize impacts on the resource; and (3) where impacts are inevitable, and all project alternatives have been examined, the impact may be mitigated by the creation of compensatory habitat acreage and values within the greenway providing that said habitat can fully mitigate the impact on the affected species.

b. The City of Petaluma shall coordinate with the California Department of Fish and Game prior to approving a mitigation program for the affected species.

Petaluma Municipal Code

Section 20.32.320 of the City of Petaluma Municipal Code contains the following general provision to preserve existing on-site vegetation during review of proposed subdivisions; ". . . the subdivision shall be so designed as to preserve the greatest amount of existing on-site vegetation, including trees with a trunk diameter of four inches or greater and other natural ground cover."

Tree Preservation Ordinance (Petaluma Implementing Zoning Ordinance, Section 17)

The City of Petaluma Tree Preservation ordinance contains a number of regulations that relate to the protection, preservation and maintenance of mature trees within the city limits. Under this ordinance the following trees are considered protected:

- Black Oak (*Quercus kelloggii*), Valley Oak (*Quercus lobata*), Blue Oak (*Quercus douglasii*), Interior Live Oak (*Quercus wisilizenii*), Coast Live Oak (Quercus agrifolia), Oracle Oak (*Quercus x morehus*), Oregon Oak (*Quercus garryana*), and other native California Oak, of four inches or greater diameter (DBH),
- California Buckeye (*Aesculus californica*) six inches DBH or greater,
- California Bay (*Umbellularia californica*) twelve inches DBH or greater,
- California or Coast Redwood (Sequoia) eighteen inches DBH or greater,
- Heritage trees as approved by Council resolution per Title 8 of the Petaluma Municipal Code,
- Significant groves or stands of trees, and trees located in riparian areas, and
- Any tree required to be planted or preserved as environmental mitigation or condition of approval for a discretionary development application or other development permit.

Petaluma's Implementing Zoning Ordinance (IZO), Section 17.050A states, "the design of every development project shall recognize the desirability of preserving protected trees to the greatest extent possible" and Section 17.060A continues: No protected tree shall be removed, cut down, or otherwise destroyed, unless a permit is issued by the Community Development Department. For site development that allows for tree removal as part of a project's conditions of approval, the written permit may be in the form of signed authorization by the Community Development Department, a tree preservation plan approved by the Community Development Department, written approval for a grading permit, encroachment permit, or other similar permit.

Further, IZO 17.060E states, "A finding of any one of the following situations shall be grounds for denial of the permit:

a. Removal or damage of a healthy tree could be avoided by:
    i. Reasonable redesign of the site plan prior to construction;
    ii. Trimming, thinning, tree surgery, or other reasonable treatment, as determined by the Community Development Director.
b. Adequate provisions for drainage, erosion control, land stability, windscreen buffers along the road and between neighbors have not been made where these problems are anticipated as a result of the removal."

Section 17.060B states the conditions under which protected tree replacement will be required:

a. Protected Trees – If the City authorizes the removal of a protected tree(s) because it is dead, dangerous, or a nuisance, no tree replacement is required.
b. Street Trees – If the City authorizes removal of a street tree in connection with a development project, it shall specify the replacement requirements in the permit authorizing removal.
c. Development Projects - For development projects that require Planning Commission/City Council approval, protected trees authorized for removal will be addressed as part of the development conditions of approval. The project applicant will be required to replace the tree or trees. The approving body shall be the deciding factor on appropriate replacement and the project will be conditioned accordingly.

Impact Analysis

Standards of Significance

In accordance with the California Environmental Quality Act (CEQA), State CEQA Guidelines (including Appendix G), City of Petaluma plans, policies and/or guidelines, and agency and professional standards, the Project's impacts on biological resources would be considered significant if it would:

1. Result in a substantial adverse effect, either directly or through habitat modification, on any species identified as a candidate, sensitive or special-status species in local or regional plans, policies, or regulations or by CDFW or USFWS;
2. Result in a substantial adverse effect on any riparian habitat or other sensitive natural community identified in local or regional plans, policies, or regulations, or by the CDFW or USWFS;
3. Result in a substantial adverse effect on wetlands as defined by the Corps under Section 404 of the Clean Water Act or the Regional Water Quality Control Board under the Porter-Cologne Act through direct removal, filling, hydrological interruption, or other means;

4. Interfere substantially with the movement of any native resident or migratory fish or wildlife species or with established native resident or migratory wildlife corridors, or impede the use of native wildlife nursery sites;
5. Conflict with any local policies or ordinances protecting biological resources, such as a tree preservation policy or ordinance; or
6. Conflict with the provisions of an adopted Habitat Conservation Plan, Natural Community Conservation Plan, or other approved local, regional, or state habitat conservation plan.

Consistency with the Petaluma River Plan Corridor

The Petaluma General Plan acknowledges the role of the Petaluma River as a central defining feature of the City. The General Plan assumes sensitive development patterns along the river corridor that allow integration of land uses, recreation, and preservation/restoration goals while implementing river terracing. The General Plan states that the Petaluma River Access and Enhancement Plan (River Plan) provides the framework for preservation and restoration of the Petaluma River Corridor.

The River Plan adds requirements to the development of properties to improve their relationship to the river. Goals of the River Plan pertaining to biological resources include, but are not limited to the following:

- Maintain the navigability of the Petaluma River
- Improve flood control
- Promote balanced use of the River corridor
- Restore, create and protect natural habitats, and enhance native vegetation along the River corridor
- Expand public access to and awareness of the River
- Assure permanent maintenance and promote public safety along the River
- Create guidelines to integrate development into the River corridor

The Project site is located along the Upstream Segment of the Petaluma River, specifically within the Corona Road to Lynch Creek Reach (see **Figure 6-5**). The Upstream Segment is the largest of the river's six segments, the most environmentally sensitive and the segment most likely to change significantly over time. The Upstream Segment extends from Willow Brook Creek at the crossing of Old Redwood Highway in the north, to the confluence of Lynch Creek immediately adjacent to the Project site to the south. The largest remaining stands of native riparian trees along the Petaluma River occur in this segment. Riparian groves are recognized as a unique resource to be protected and enhanced. The General Plan and the River Plan both emphasize a balance of uses. Property owners are encouraged to respond to the river setting and integrate flood management needs, public use of the greenway, and natural habitat protection and enhancement into future development plans.

The last remaining vestige of the Petaluma River's oak woodlands and other mature riparian trees can also be found in the Upstream Segment of the River, including within portions of the Project site. Clusters of mature Coast live oak, willow, California box elder and Oregon ash are visible from Highway 101, "marking the location of the River in contrast to the adjacent grassy fields. These are considered a local treasure to be enjoyed, but protected, for generations to come. The high tree canopy, found nowhere else in such abundance along the River, provides important habitat, helps keep the river channel clear of weeds and brush that choke flood waters, and provides a visual reference of the River's existence throughout much of the valley." Because of the habitat's sensitivity to disturbance, the River

Plan recommends, “large preservation zones and limited public access to better protect the important plants and animals, allow natural re-growth of these magnificent trees, and recreate a bit of local natural history.”

The Upstream Segment of the Petaluma River also offers an unusual opportunity to, “extend the existing riparian woodland and to re-establish a natural riparian forest ecosystem with high aesthetic and biological values through the entire reach. The natural riparian forest is not uniform, but contains openings with seasonal wet meadows, dense willow thickets on the banks, mature stands of trees such as ash and box elder on the stable landforms, and fringe areas which graduate from oak woodlands and buckeye groves to oak scattered grasslands containing seasonal wetlands. Wet meadow openings within the forested areas are usually less than 1/4 acre in size, and seasonal wetlands at the fringes of the oak woodlands can cover up to 10% of the width of the corridor. In combination, these sub-types constitute the deciduous riparian community historically common to the Petaluma River valley, with variations throughout the valley based upon the particular soil, hydrologic, micro-climatic, and other conditions of the individual sites.”

As indicated in the River Plan (section 3.2.2), the River Plan is not a flood control plan. Rather it acknowledges that “flood protection measures are recommended by the General Plan, assumes these measures will proceed, and provides policy direction on how flood protection could better meet the community’s multiple goals and objectives for the waterfront”. The Flood Management objectives of the River Plan “encourage the design of flood protection alterations [to be] as environmentally sensitive and aesthetically pleasing a manner as possible”, and that “flood protection measures should accommodate the enhancement and/or restoration of a continuous riparian habitat . . . “

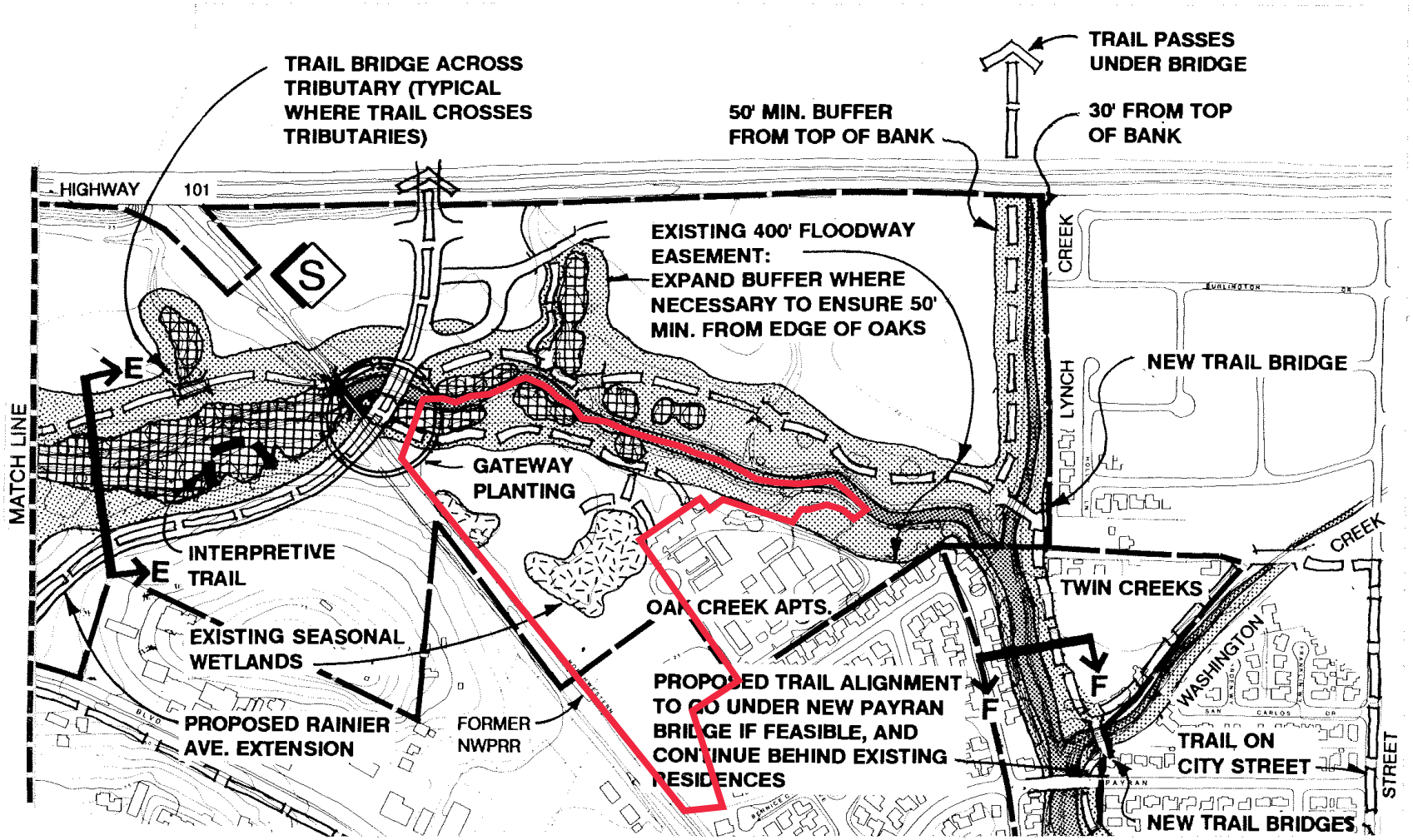

Figure 6-5
River Plan, as Applies to the Project Site

Source: City of Petaluma, PEtaluma River Access and Enhancement Plan, page 63

According to the River Plan, "No subdivision, use permit, design review or other entitlement for land use shall be authorized for construction in the designated River Corridor[10] if that proposed action is not in substantial compliance with the Petaluma River Access and Enhancement Plan." The discussion below compares the Project's proposed land use and development plan, including its proposed terrace grading plan along the River, to the general planning and design concepts of the River Plan.

Project's Proposed Habitat Mitigation Monitoring Plan

The Project has two purposes. The primary is development of the proposed Sid Commons residential neighborhood with new apartments, roadways and parking. This portion of the Project will construct apartment buildings west of the River in an area that is outside of the floodplain and previously disturbed as a result of prior soil removal and annual fire control. The secondary purpose is creation of a Petaluma River terrace as directed by the Petaluma General Plan, and that includes re-contouring the western bank of the Petaluma River channel to improve citywide floodwater attenuation and conveyance during floods. This terracing project is to be accomplished in conjunction with the overall Petaluma River Flood Control Project initiated by the Corps of Engineers. It will unavoidably impact certain biological resources along the Riverbanks including riparian and oak woodland habitat.

The Project applicant has prepared a draft Habitat Mitigation Monitoring Plan (HMMP) addressing habitat replacement and mitigation for impacts that will be caused by the project including the proposed river terracing and residential development (**Appendix 6C**). The HMMP is needed to meet environmental review requirements of the City of Petaluma, and to prepare regulatory permit applications to the United States Army Corps of Engineers (Corps) Section 404 Clean Water Act, Regional Water Quality Control Board (RWQCB) Section 401 Water Quality Certification, and California of Department Fish and Wildlife (CDFW) Code Section 1602 Notification of Streambed Alteration Agreement. The draft HMMP identifies the estimated impacts of the proposed Project, both the development and River terracing; proposes habitat replacement and mitigation goals and activities; creates a habitat replacement and mitigation implementation and planting plan; and provides for the maintenance and monitoring of replaced and created habitats. The HMMP has been designed with the following objectives:

- preserve existing native riparian "high value" habitat where practicable,
- increase the acreage of aquatic habitat within the Project area,
- increase the functions and values of the existing habitat, and
- improve flood capacity of the Petaluma River.

The following provides a comparative assessment of the Project's proposed draft HMMP to the objective, policies and guidelines of the River Plan.

Preservation Zone

The River Plan's Preservation Zone applies to critical habitat areas with valuable remnants of riparian and oak woodland, wetlands and other unique or threatened habitats. It contains a greater diversity of species with older specimen trees than other areas, which contain only scattered, remnant trees.

[10] The River Plan's term "River Corridor" is the area this document calls the River Plan Corridor (and the River Plan calls the greenway) together with the River Oriented Development Zone.

Pursuant to the River Plan, all development (including trails, grading and flood control alterations) shall be severely restricted in this zone. Minimal intrusions in carefully selected locations will be allowed for interpretive purposes only. Special measures to protect specimen trees, such as temporary fencing, shall be required for construction activities at the periphery of the Preservation Zone. Grading alterations shall be kept a minimum of 50' away from the drip lines of trees. The width of the zone varies, as it is defined by the occurrence of significant vegetation. Specific to the site, the River Plan[11] directs the establishment of a Preservation Zone for the remnant Oak Grove/Riparian Woodlands upstream of Lynch Creek, being the last remaining vestige of the Petaluma River's oak woodlands mixed with other mature riparian trees, visibly marking the Petaluma River in contract to adjacent grassy fields. The Preservation Zones at the Project site, as shown in **Figure 6-6**, are inclusive of high value riparian habitat, oak woodland habitats that visibly mark the River in contrast to the adjacent grassy field, and the site's preserved riverside wetlands (0.28 acres).

Project's Consistency with Preservation Zone

The Project includes a proposed design for construction of a flood terrace to allow the River to accommodate a 100-year storm event within a modified river channel. Consistent with the River Plan's recommendations, the Project's proposed terraced grading plan includes creation of a low-flow channel and grassy flood terraces, both with vegetated banks and bank tops. As discussed below in greater detail for individual biological resources, the Project does incorporate certain strategies that seek to preserve significant high priority vegetation as well as lower priority vegetation within the existing riparian and oak woodlands habitats. This preservation strategy, as outlined in the draft HMMP involves a contoured grading plan which shapes the graded terraces such that elements of these habitat types can be preserved (see **Figure 6-7**):

- All construction activities will avoid disturbance to river waters habitat and infrequent patches of tules, as construction activities will be confined to occur above the ordinary high-water mark (OHWM) of the Petaluma River.
- Approximately 0.28 acres of seasonal wetlands that are located in proximity to the River and immediately north of the Oak Creek Apartments will be avoided and preserved, but 0.34 acres of lower quality existing seasonal wetlands, primarily located on the upland portion of the Project site, will be removed/ filled for new development.
- Riparian areas occupied by native willows that are considered high value habitat are avoided where practicable without severely diminishing the hydraulic flood flow capacity of the proposed terracing project. The terrace project will avoid 0.30 acre of this high quality native riparian vegetation, but will remove 1.62 acres of other riparian habitat, most of which is considered lower quality, non-native Himalayan blackberry vegetation.

[11] River Access and Enhancement Plan pages 64 and policy 14 at page 77

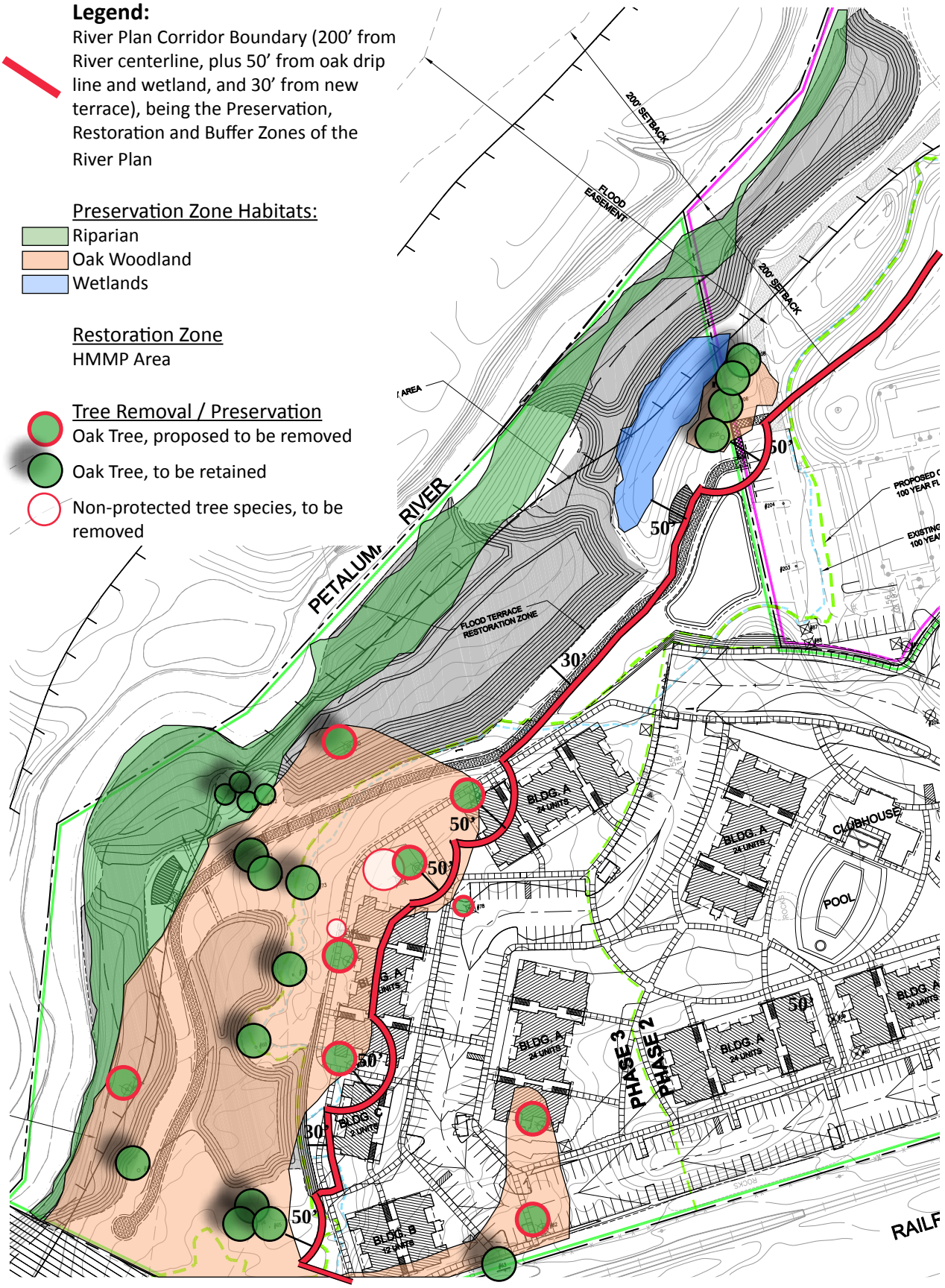

Figure 6-6
Project's Comparison to River Plan Corridor

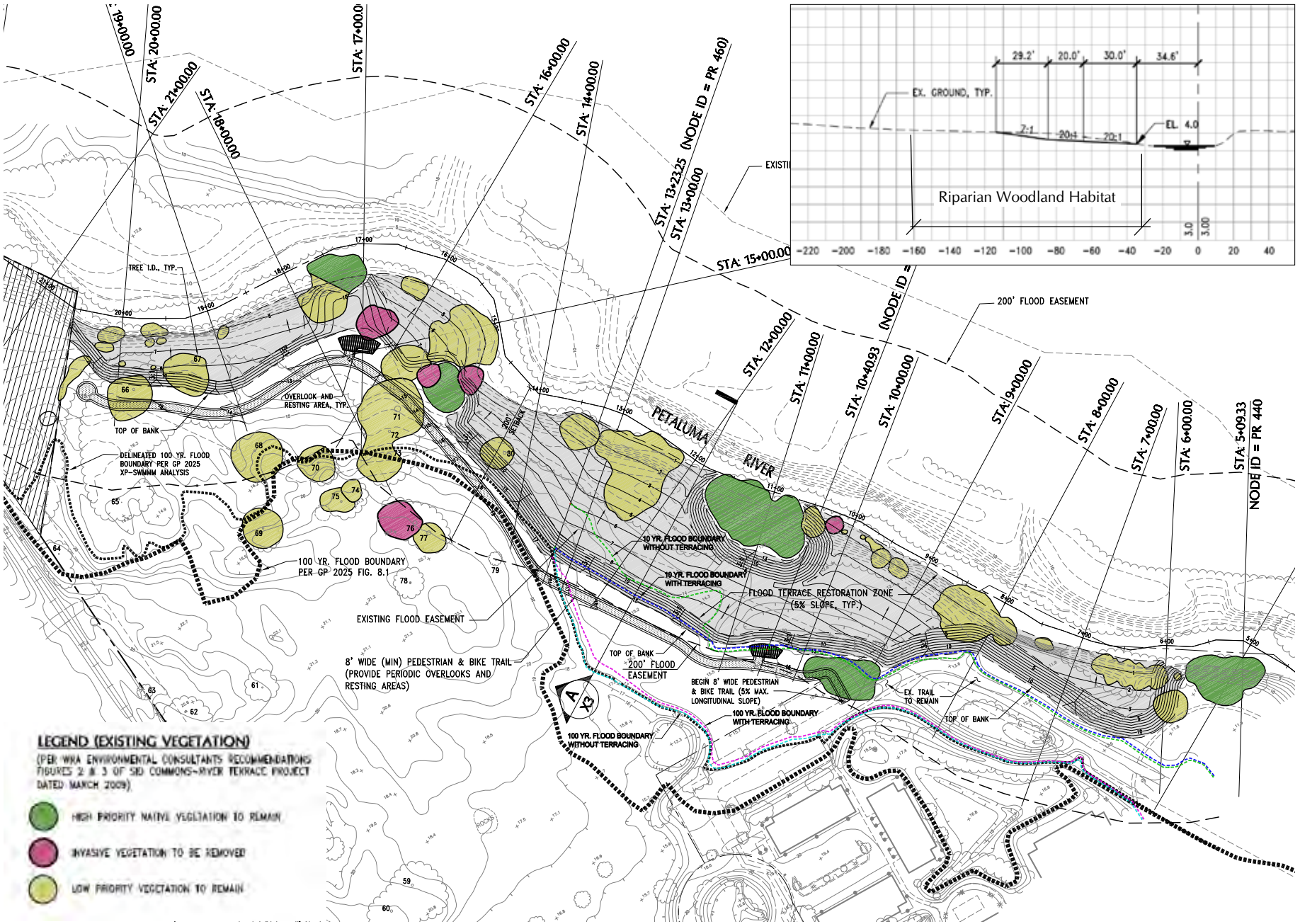

Figure 6-7
Terraced Grading and Vegetation Preservation Plan, Petaluma River Corridor

Source: CSW/Stuber-Stroeh Engineering Group

The contoured grading plan also seeks to shape the design of graded terraces to avoid, where possible, removal of existing trees within the riparian and oak woodland habitats. Although this grading plan is able to avoid removal of 25 of the existing 27 trees within identified riparian and oak woodlands habitat along the River, the river terracing plan does propose removal of 2 protected oak trees (trees 67 and 80) in order to accommodate the terracing as well as 3 non-protected trees. While the River Plan directs flood protection alterations to occur in environmentally sensitive manner, it anticipates that creation of a River terrace may necessitate some habitat removal, directing avoidance of sensitive habitat were possible and directing habitat restoration generally (see Restoration Zone discussion below). Loss of 8% of the protected trees within the River Corridor (2 of 27) for the purpose of the river terracing directed by the General Plan does not appear inconsistent with River Plan policies. However, the Project's proposed development plan for new apartments encroaches into the Preservation Zone comprised of the oak woodland habitat at the River. The conceptual site plan shows approximately three apartment buildings extending into the Preservation Zone and calls for removal of 4 native oaks and 1 small native bay (oaks 69, 75, 77, and 79 and bay 74).

Restoration Zone

The River Plan's Restoration Zone includes those portions of the riverbank and top-of-bank areas that require restoration. These are generally areas that will have disturbed vegetation but which, if stabilized and restored, could contribute significantly to the wildlife and fishery habitat values and water quality of the greenway. This zone also includes new flood terraces. The top of bank restoration areas varies between 10 and 30 feet depending upon the extent of the existing habitat to be restored and the extent of land available for restoration. Restoration treatments may include re-grading, slope stabilization, and planting with genetically local native riparian and upland species. Access shall be generally restricted from the banks and bank-top areas in this zone except at carefully selected and controlled points. Almost all riverbanks in the river corridor are candidates for restoration treatments. Some grassy banks created by flood control alterations may be available for public access, select overlooks and interpretive areas. Exotics and invasive plants are to be replaced with native or compatible species and plant communities (River Plan Policy 5 page 45).

Project's Consistency with Restoration Zone Strategies

The Project's draft HMMP intends to provide for the replacement of existing on-site wetlands and riparian habitat; to create additional high-quality wetlands and riparian habitat; and increase the overall functions and values of wetlands and riparian habitat present in the Project Area. The Restoration Zone is that area covered by the HMMP (**Figure 6-8**). Individual elements of the HMMP's restoration plan are described below:

- Seasonal wetland creation will occur in the graded terrace floodway area as mitigation for impacts to seasonal wetlands. The created wetlands include approximately 0.54 acres of seasonal wetland habitat that replaces and/or exceeds the functional value of seasonal wetlands impacted by upland development. These restored and created wetlands are designed to ensure appropriate wetland hydrology and native wetland plant establishment to better attenuate flood flows, increase coverage by native vegetation, increase wildlife habitat value, and increase habitat complexity and sustainability, and improve water quality.

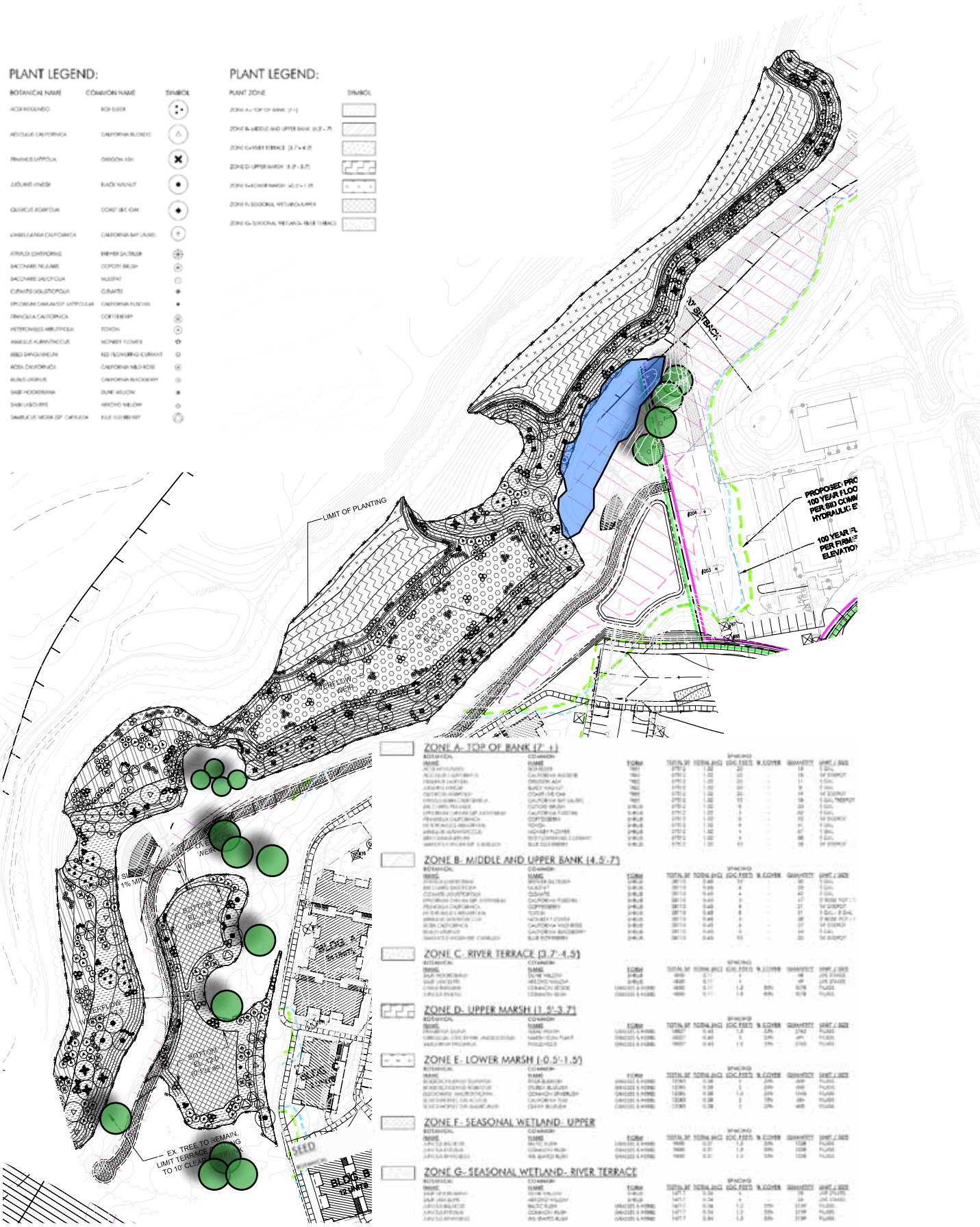

Figure 6-8
Project's HMMP Planting and Restoration Plan

Source: WRA, Habitat Mitigation and Monitoring Plan, June 2016

- Riparian habitat impacted by terrace grading (see Figure 6-7) will be replaced and expanded. The 1.62 acres of impacted riparian habitat will be restored, and additional riparian habitat of 0.46 acres will be created (2.08 acres total) along the channel below the expanded top of bank. Riparian plantings are proposed to replace the ecological functions and values that the removed riparian trees provided to the Petaluma River, and to also increase habitat in area and functional value. The new riparian habitat is intended to be of higher quality, as the tree composition will be similar to existing tree riparian but expanded in area and no longer containing invasive monocultures of non-native invasive species such as Himalayan blackberry.
- Removal of protected trees (the two valley oaks proposed to be removed to create the river terrace) will be replaced according to the Petaluma City Tree Ordinance. New trees and shrubs will be installed in positions within the ecotone between the developed uplands and the riparian and wetlands habitat areas to create a transition area, and to augment existing trees to be preserved.

Restoration and creation of wetlands and riparian areas will include planting native vegetation known to establish successfully within wetlands and along non-wetland waters, with native seasonal wetland plant species similar to those found in similar habitats in the region. Plant materials are to include seeds and container plants of native grasses, forbs, shrubs, and trees. Riparian plantings will be salvaged from removed vegetation and replanted (particularly the native willows within the riparian area), or may be sourced for live staking in the riparian areas after grading is complete. This is intended to help to control erosion of newly disturbed soils on the upland side of the wetlands and to reduce invasion of non-native vegetation.

Suitable habitat for these plant species is expected to be present within the created and restored wetlands and riparian habitat following grading, at elevations appropriate for the habitat types. Plants expected to grow in created wetland, riparian and upland areas after restoration will consist of native and non-native vegetation, with native upland species planted similar to those found in existing seasonal wetlands and upland habitat in the vicinity. The plant material type, size and spacing is planned to encourage quick establishment of native wetland species and discourage colonization by invasive species.

The restoration goal is to establish coverage of native vegetation, and for riparian areas to re-establish at levels that match or exceed current riparian canopy coverage. When grading and planting is completed, the amount of existing riparian and wetlands habitat will be increased by a net of 1.17 acres of total area, and much of the lower quality habitat will be replaced by higher quality habitat planted with native trees, shrubs, and wetlands plants.

The HMMP and the Project appears consistent with the Restoration Zone policies.

Buffer Zone

The River Plan also calls for a Buffer Zone within the Petaluma River Plan Corridor[12], intended to provide a degree of protection to restored and preserved habitats along the River, a transitional setback from the riverbanks to the adjacent River Oriented Development Zone, and to provide an undeveloped area in which a trail and related amenities can be located. Within this reach of the River, the Buffer Zone is defined as being at least to the upland extent of both the 400-foot wide River Access Easement and the 200-foot from River centerline and extended to buffer site specific features in the following way:

[12] The same area that this document refers to as the Petaluma River Plan Corridor, the River Plan calls the greenway.

- From existing mature oak trees, 50 feet from the dripline (Policy 13j, 14 and map page 63);
- From existing seasonal wetlands, 50 feet from the edge or top of bank (Policy 14, page 77); and
- From top of the new bank where terracing is created, at least 30 feet (Policy 13d page 74)

Public access and amenities are allowed within the Buffer Zone (except in areas of existing sensitive habitat, where access shall be kept to the outer edge), but parking and buildings and residential improvements are prohibited. Enhancement of the Buffer Zone is to include new planting with native riparian and upland vegetation.

Project's Consistency with Buffer Zone Strategies

As indicated in Figure 6-6, the residential component of the Project is generally outside of the Buffer Zone at the downstream half of the Project site's river frontage. However, the residential component of the Project encroaches into the Buffer Zone (as well as the Preservation Zone beyond) at the upstream half of the Project, and is therefore inconsistent with the River Plan.

- River Trail Location: The River Plan allows the river trail location to be within the Buffer zone; generally, at bank top, and meandering to avoid sensitive habitat areas. Pursuant to the River Plan, where channel modifications are made for flood mitigation, the preferred trail location may be the created flood terrace, in order to create the sense of a "nature trail". It continues that to the extent possible, the trail should take advantage of the different landscapes, moving from flood terrace meadow to bank top riparian woods, to maintain focus on the natural landscape. The trail should be kept out of the Preservation and Restoration Zones and should avoid impacts to wetlands; though a short interpretive trail may go through a portion of the Oak Grove/ Riparian Woodland and occasionally to overlooks in the Restoration Zones. [13]
- Consistency of River Tail Location: The Project proposes a river trail that meanders from outside the new terraced top of bank (being within the Buffer Zone) into the flood terrace, passing through a portion of the Oak Grove/Riparian Woodland. The proposed river trail will be conditioned to extend from property line to property line. As proposed, the river trail includes two overlook areas and interpretive signage. The trail design and location will be further considered as a part of the SPAR review process, but as proposed, it appears consistent with a river trail option directed by the River Plan.

River Oriented Development Zone

The area outside of the Preservation, Restoration, and Buffer management zones that comprise the Petaluma River Corridor (also referred to by the River Plan as the greenway) on properties abutting the river is defined by the River Plan as the River Oriented Development Zone (RODZ). Development is allowed and encouraged within the RODZ, and may include new buildings, roads, parking, service yards, drainage features, planting and private open space. Such development is to be carefully designed to integrate with the nature landscape and river features; direction includes: ensuring architectural interest, articulation, and detailing in building facades facing the river, considering how building scale, coverage, and clustering can best be designed to relate to the river, siting "people spaces" to take maximum advantage of river overlook, and avoiding locating parking along the river frontage.

[13] Petaluma River Access and Enhancement Plan, pages 68-69.

Protection and restoration of fragile habitat isolated in the RODZ, such as oaks and seasonal wetlands, is directed whenever feasible. Landscaping in the RODZ should appear to be an extension of the riparian and upland habitat, especially in the areas closest to the river; appropriate plants include native riparian and upland species, as well as appropriate non-native species that have some habitat values. The RODZ is applicable to properties fronting along the River, and applies principally to the proposed northern residential development on existing Assessor's Parcels -009. Existing Parcel -006 does not front along the River, and is not mapped as within the RODZ area.

Project's Consistency with RODZ Strategies

The Project's northern residential development area, including new apartment buildings, parking areas and roadways, are all located within this RODZ, with the exception of where this development encroaches into the Buffer and Preservation Zones, as described above. Generally, the current conceptual site plan presents come conflicts with the River Plan's RODZ Policies. The City's Site Plan and Architectural Review process specifically provides an opportunity to refine the project design to better align with the RODZ policies and the River Plan Design Guidelines at Chapter 9.

Environmental Restoration and Management Plans

Implementation of the River Plan depends in large part on construction of site improvements by Riverfront property owners as part of the development process. Site-specific Environmental Restoration and Management Plans area required for submittal along with development proposals. Restoration and enhancement of some segments may be completed as part of an environmental mitigation program. Each of the restoration, enhancement, and mitigation projects will require preparation of detailed plans and specifications prior to their construction. In many cases, the required plans will be a part of the City/Agency review and permitting process, including CEQA review and wetlands permitting by the Corps. The River Plan provides guidelines for preparation of the various environmental restoration and management elements that may be required.

Project's Consistency with Restoration and Management Plan Requirements

The Project's HMMP clearly indicates that the Project applicant will be solely responsible for developing, implementing, maintaining and monitoring the proposed habitat restoration and creation activities associated with the Project. This includes providing the land, property management, compliance with local, state, and federal laws and regulations, implementation of habitat improvements, and monitoring and reporting on the success of the mitigation. Maintenance activities during the five-year monitoring period are proposed to include erosion control (and repair should an extreme storm event occur); inspection for signs of vandalism or other disturbance to recreated and restored areas; inspections for colonization of problematic non-native plants, and action to control their spread. As-built conditions for the newly created and restored areas will be prepared and submitted to the RWQCB, Corps, CDFW, and other appropriate agencies within 45 days of implementation. The applicant will document construction activities, report final impact acreages, provide final drawings of construction for the created and restored areas, explain any substantive changes made from the plan, and include before and after photographs.

Monitoring of the habitat replacement and mitigation areas will occur annually over a period of five years beginning after one full rainy season following construction and planting. Data will be collected each year in order to assess the successful creation of wetland hydrology and establishment of native vegetation. Ultimate success criteria of the draft HMMP include the following:

- Wetlands hydrology – 14 consecutive days of surface saturation or inundation

- Wetlands soils - meets hydrology and vegetation criteria
- Wetlands vegetation - meet the Corps 50/20 dominance rule for native and naturalized plant components
- Riparian vegetation - native and naturalized target plant species in the herb strata ≥ 50% average absolute cover
- Survival of installed plantings - survivorship of tree, shrub, and herb strata container plants ≥ 75%
- Control of exotics - ≤10% absolute cover of non-gaminoids considered highly invasive per Cal-IPC or equivalent

Approval of the HMMP is subject to the jurisdictional authority of other agencies outside of the City of Petaluma, including the US Army Corps of Engineers, the San Francisco Regional Water Quality Control Board, and the California Department of Fish and Wildlife. The City will not issue grading permits for work within the Riverbanks prior to the applicant obtaining all necessary resource agency permits and approvals, including the incorporation of all subsequent conditions and requirements of these agency approvals into the proposed grading plans.

Special Status Plant Species

Bio-1: Implementation of the Project would not result in a substantial adverse effect on candidate, sensitive or special-status plant species, either directly or through habitat modification. (**Less than Significant)**

Potential special status plant habitats in the Project area were evaluated in 2008 and cross-referenced with CNDDB and CNPS lists of special status plants potentially present in the region. Based on the habitat types present and other knowledge of the site, special status plant species were determined to have either low potential for being present, or were determined to be not present at the Project site. Therefore, it is considered that the potential for the Project to result in adverse impacts on special status plant species is less than significant.

Mitigation Measures

None required

Special Status Bird and Bat Species

Bio-2: Implementation of the Project could result in a substantial adverse effect on candidate, sensitive or special-status bird and bat species, both directly and through habitat modification. (**Less than Significant with Mitigation)**

Based on existing habitat conditions, there is a moderate to high potential for occurrence of four special status bird species and raptors to occur at the Project site.

Trees along the Petaluma River could provide suitable nesting habitat, and grasslands on the site provide suitable foraging habitat for the White-Tailed Kite, a CDFW fully protected species. The Allen's Hummingbird, a USFWS Species of Conservation Concern, are common breeding species in riparian and scrub habitats, and may breed at the Project site along Petaluma River. Grasslands and adjacent shrubs and riparian trees within the Project site provide suitable foraging and nesting habitat for Loggerhead

Shrike, a CDFW Species of Special Concern and a federal Species of Conservation Concern. Salt marsh common yellowthroat, a federal Species of Conservation Concern and a CDFW Species of Concern, may nest along Petaluma River in emergent vegetation or willows. Furthermore, the oak and riparian woodlands that exist on three sides of the Project site also provides suitable nesting habitat for several raptor species.

Potentially significant impacts to these bird species include nest and/or young abandonment, resulting from grading or construction disturbance.

While project site surveys did not find habitat suitable for area bat species, the 2017 arborist study noted two trees with cavities. Such cavities may provide suitable roosting habitat for some bat species such as the pallid bat.

Mitigation Measures

To address the potential for Project-related grading and construction activities to affect special status bird species, the following mitigation measure is recommended.

Mitigation Measure Bio-2a: Pre-Construction Nesting Surveys. If grading operations or construction is scheduled during the nesting season of migratory birds (February 1 through August 30), trees in the Project site shall be surveyed including call surveys as appropriate for nesting migratory birds.

a) Surveys shall be conducted within the following buffers of the construction site: 1) 150 feet for nesting raptors, and 2) 500 feet for nesting passerines.

b) The surveys shall be conducted no more than 15 days prior to the start of any ground disturbing activities.

c) If an active nest is found prior to construction or during construction activities, a qualified biologist, in consultation with CDFW, shall determine the appropriate buffer size and delineate the buffer using ESA-approved fencing, pin flags, and/or yellow-caution tape. A buffer zone shall be maintained around all active nest sites until the young have fledged and are foraging independently.

d) In the event that an active nest is found after the completion of preconstruction surveys and after construction begins, all construction activities shall be stopped until a qualified biologist has evaluated the nest and erected the appropriate buffer around it.

Mitigation Measure Bio-2b: Pre-Construction Tree Roost Surveys. For all tree removal and vegetation management activities the following measures shall be implemented to protect bats:

a) In order to avoid the bat maternity periods and ensure protection of bat species tree removal shall be conducted between September 1st and March 31st. Should maintenance activities necessitate tree removal during the maternity roosting season (April 1st – August 31st) then a qualified biologist shall first perform a bat roost survey of trees within 7 days to determine if roosts are present. If no evidence is found, activities may proceed. In the event that an active roost is observed within the work area than a work exclusion zone of 50 to 250 feet shall be established. Work within the exclusion zone shall not be permitted until the maternity roosting season has completed. The appropriate size of the exclusion zone shall be determined by a qualified biologist based upon the species and its susceptibility to disturbance.

b) Any tree removal with breast diameter height (dbh) greater than 12 inches or with complex

bark structures or cavities shall be felled and allowed to rest on the ground overnight prior to removal.

c) Maintenance activities shall avoid the dust and dawn period to preclude impacts to emerging bats. Rather, activities shall occur between 1 hour after sunrise and one hour before sunset.

Resulting Level of Significance

Required nesting surveys and the protection of any identified nests as required pursuant to MM Bio-2a and 2b would prevent harm to special status bird and bat species, and would to prevent harm to more common types of birds pursuant to the Migratory Bird Treaty Act, and would mitigate impacts to special status bird and bat species to a level of less than significant.

Special Status Reptile, Amphibian and Fish Species

Bio-3: Implementation of the Project could result in an adverse effect on candidate, sensitive or special-status reptile, and amphibian and fish species, both directly and through habitat modification. (**Less than Significant with Mitigation)**

The assessment of existing conditions determined that special status species habitat is unlikely to occur on the uplands portion of the site that is proposed for development. The upland development portions of the Project site provide low potential for western pond turtle as suitable aquatic habitat is not present, and provides no suitable breeding habitat for California red-legged frog. The Project site provides very low potential for California horned lizard, as this species has probably been extirpated in Sonoma County.[14] The site is not within the potential range of California tiger salamander.[15] Foothill yellow-legged frog and California freshwater shrimp are considered not present within the upland development portions of the site as suitable stream habitat is not present.

Although the following special status species are unlikely to occur within the upland development area, they do have the potential of occurring along the banks or within the Petaluma River. The Project's proposed construction of a river terrace expanding the banks of the River, as directed by the General Plan, may result in both direct and indirect adverse effects. Grading of the floodway terrace adjacent to the River, and trimming and clearing of vegetation along the bank could result in the removal of habitat for California red-legged frog and Western pond turtle, and degradation of special status fisheries habitat.

California Red-Legged Frog

The somewhat tidally influenced section of the Petaluma River at the Project site is not considered suitable aquatic breeding or non-breeding habitat for California red-legged frog (CRLF). CRLF are sensitive to high salinity levels, particularly in tidally influenced areas. There are recorded occurrences of the CRLF within a three-mile radius of the site (CNDDB 2013), but there are substantial barriers between those recorded locations and the Project site. For these reasons, there is only a low to moderate potential that CRLF could use the site. Although CRLF are not expected to occur in the Project site on any

[14] per Jennings and Hayes, 1994

[15] USFWS, 2003

regular basis, or for any extended period of time due to the lack of suitable habitat on-site and marginal dispersal habitat, the possibility cannot be ruled out that CRLF may move through the Project area during grading operations.[16]

Western Pond Turtle

The Project's grading operations on the Petaluma River bank would not contribute to permanent habitat loss for western pond turtles, as no suitable aquatic habitat exists within the Project site. However, turtles may occasionally nest near Project boundary and could be disrupted as a result of terrace grading operations.

Central California Coast Steelhead DPS, Southern Green Sturgeon DPS, Sacramento Splittail

Designated critical habitat for the Central California Coastal steelhead is present within the Project site. Unintentional introduction of sediment into the water from erosion or runoff has the potential to affect steelhead, green sturgeon and/or the Sacramento splittail's feeding rates and growth, increase mortality, cause behavioral avoidance, and reduce macro-invertebrate prey populations. Similarly, the unintended introduction of petrochemicals associated with grading equipment (fuel or other petrochemical release into waters) could injure or kill these fish populations and/or their macro-invertebrate prey populations.

Required Agency Permits and Approvals

The Project applicant shall obtain all required authorizations from the U.S. Army Corps, the RWQCB, the California Department of Fish and Wildlife, and other regulatory agencies with jurisdiction (as applicable) for the disturbance of waters of the U.S. and their associated aquatic habitat. Copies of applicable permits shall be obtained by the Project applicant and provided to the City of Petaluma prior to grading, and the Project applicant shall implement all avoidance and minimization measures as required by these agency authorizations.

- Any proposed discharges of dredged or fill material to the Petaluma River will require Department of the Army Corps of Engineers (USACE) authorization and the issuance of a permit under Section 10 of the Rivers and Harbors Act.
- State Water Quality Certification pursuant to the Porter-Cologne Act as issued by the San Francisco Bay RWQCB, shall be required for any direct removal, filling or hydrological interruption to the River, or other effects on water quality.
- Alterations to the Petaluma River streambed may also require a Streambed Alteration Agreement issued by the California Department of Fish and Wildlife, pursuant to Section 1602 of the Fish and Game Code.
- The USACE would determine if they need to enter into consultation with the National Marine Fisheries Service (NMFS) for impacts on the federally listed Central California Costal Steelhead DPS and green sturgeon DPS. If consultation with the NMFS for the Central California Coast California steelhead DPS and green sturgeon DPS is needed, the Project applicant shall comply with all the terms and conditions required by the NMFS.

[16] City of Petaluma, Rainier Cross Town Connector Draft EIR, page 4.3-23

Mitigation Measures

The Project applicant shall implement the following mitigation measures, in addition to all avoidance and minimization measures as required by the resource agency authorizations as required, above.

Mitigation Measure Bio-3A: Limitations on the Grading Period. To the extent feasible, limit grading in the river area to the dry season, between June 15 and October 15, when low flow conditions are present in the River. Limit vegetation removal to the period between June 15 and November 15 to avoid potential impacts to anadromous fish species and nesting birds, and to avoid interfering with adult spawning migrations or the outmigration of smolts.

Mitigation Measure Bio-3B: Pre-Construction Surveys. A qualified USFWS-approved biologist shall conduct pre-construction surveys of all ground disturbance areas within suitable habitats in the Project site to determine if California red-legged frogs and Western pond turtles are present prior to the start of grading operations. These surveys shall be conducted within 48 hours prior to the initiation of grading activities in habitats where these species have the potential to occur.

a) Preconstruction surveys to detect western pond turtles should focus on suitable aerial and aquatic basking or nesting habitat such as logs, branches and riprap, as well as the shoreline and adjacent warm, shallow waters where pond turtles may be present below the water surface beneath algal mats or other surface vegetation.

b) Where feasible, preconstruction surveys to detect western pond turtle nesting activity should be concentrated within 0.25 mile of suitable aquatic habitat and should focus on areas along south- or west-facing slopes with bare hard-packed clay or silt soils or a sparse vegetation of short grasses or forbs.

Mitigation Measure Bio-3C: Relocation. If any special status species are found, they shall either be re-located, or an exclusion zone shall be established and maintained around the occupied habitat until the biological monitor, in consultation with the resource agencies, determines construction activities can proceed in these zones.

a) Any re-location efforts shall be pre-approved by the resource agencies.

b) If CRLF or WPT or their nesting sites are found, the biologist shall contact the CDFW to determine whether relocation and/or exclusion buffers and nest enclosures are appropriate. If the CDFW approves of moving the animal, the biologist shall be allowed sufficient time to move the animal(s) from the work site before work activities begin.

Mitigation Measure Bio-3D: Implement Best Management Practices. Avoidance and minimization measures shall be employed prior to and during construction, as required and/or approved by the resource agencies, to protect special status species and sensitive habitats. These measures shall include, but not be limited to:

a) A USFWS-approved biologist shall be present during grading and clearing activities that could result in harm to these species. The approved biologist shall have stop-work authority in the event that a California red-legged frog or Western pond turtle is found within the Project site.

b) Install exclusion fencing around grading and clearing zones to keep species out. The areas approved for grading and clearing shall be delineated with temporary high-visibility orange-colored fence at least 4 feet in height, flagging, or other barriers. Signs shall be posted that

clearly state that construction personnel and equipment shall not move outside of the marked area. The fencing shall be inspected by the USFWS-approved biologist and maintained daily until project completion. The fencing shall be removed only when all construction equipment is removed from the site. No construction activities shall take place outside the delineated project site.

c) Have the Biological Monitor survey each zone periodically and relocate species as necessary.

d) Prior to construction, a qualified biologist shall conduct training sessions to familiarize all construction personnel with the following: identification of California red-legged frog and their habitat, Western pond turtle and their habitat, identification of protected salmonids and their habitats, general provisions and protections afforded by the Endangered Species Act, measures implemented to protect the species, and a review of project site boundaries.

e) To avoid attracting predators, food-related trash shall be kept in closed containers and removed daily from the project site.

f) At the end of each day, all construction-related holes or trenches deeper than 1 foot shall be covered to prevent entrapment of potential California red-legged frog. During the process of reviewing the USACE permit application, the USACE would determine if they need to enter into consultation with the USFWS for impacts on the federally listed California red-legged frog. If consultation with the USFWS for the California red-legged frog is needed, the City of Petaluma would comply with all the terms and conditions required by the USFWS.

Resulting Level of Significance

Implementation of the above mitigation measures would reduce potential impacts of the proposed Project on special status species and sensitive habitats to a level of less than significant. It is anticipated that once construction of the Petaluma River terrace and the HMMP is complete, habitat for these species will be restored and possibly increased as a result.

Seasonal Wetlands

Bio-4: Development of the Project will result in the direct removal and fill of approximately 0.34 acres of seasonal wetlands defined by the US Army Corps of Engineers as jurisdictional wetlands under Section 404 of the Clean Water Act. (**Less than Significant with Mitigation**)

The Project will involve work in two areas, the Petaluma River terrace construction (which involves the area immediately adjacent to the River), and the residential development which will affect areas west of the River consisting of mostly uplands but with some seasonal wetlands.

Seasonal wetlands are present in the Project's uplands area; these exist as eight depressions and swales totaling 0.62 acres. The vegetation in these seasonal wetlands is dominated by non-native facultative and facultative wetland grasses and herbs, with native species typically not represented as dominant species. The most frequently observed species included Mediterranean barley, Italian rye grass, and fiddle dock. The functions and values of these seasonal wetlands rate low to moderate. There is some flood flow storage in one of the deeper seasonal wetlands (the 0.28-acre wetland near the river), but for the most part these seasonal wetlands are shallow and do not contribute substantially to flood flow attenuation. The seasonal wetlands are dry most of the year and subject to discing as part of the non-native grassland fire control, which reduces their value to wildlife, both aquatic and terrestrial species.

Six of these small seasonal wetlands, comprising 0.33 acres in total, are isolated from the river and above the 100- year flood elevation, located on the Project site's westerly side near the SMART rail line, and are comprised of depressions apparently created when soil was excavated from these areas and used for prior construction of the adjacent Oak Creek Apartments project. The seventh and smallest seasonal wetland is comprised of 0.01 acres and is located near the river and within the floodplain. These 0.34 acres of existing seasonal wetlands are proposed to be filled as part of the Project (including the six isolated wetlands where the new residential buildings are proposed and the 0.01-acre wetland located within the proposed flood terrace area). Each of these small seasonal wetlands is generally of low quality and provide limited habitat for wildlife. Nevertheless, the loss of these wetlands is considered a significant impact.

The eighth and largest seasonal wetland on site (approximately 0.28 acres in size), is located along the upper bank and within the floodplain of the Petaluma River, immediately north of the existing Oak Creek Apartments; it is a higher quality wetland that the others. This seasonal wetlands (representing 45% of the total seasonal wetlands on the site) will be avoided and preserved.

Project's Proposed Habitat Mitigation and Monitoring Program

The Project includes a proposed *Habitat Mitigation and Monitoring Program* (HMMP - WRA, June 2016) that includes, among other goals, the creation of new perennial and seasonal wetland habitat within the Project area as mitigation for impacted wetlands, and that will also augment habitat value and increase habitat complexity along the River.

The Project proposes to re-contour the upland area along the western bank of the Petaluma River to improve flood capacity and flow efficiency, and create a more diverse assemblage of riparian and wetland (perennial and seasonal) habitats. The Project's proposed design will replace and create new seasonal and perennial wetlands (see **Table 6-2**) while further enhancing the existing wetlands habitats to be preserved. The seasonal wetlands mitigation area is proposed to be on the northern portion of the Project site, and will be graded/excavated to form two separate seasonal wetlands. After grading, both of these new seasonal wetlands will be planted and seeded with native wetland plants suitable to seasonal wetlands habitat. These newly created seasonal wetlands are proposed as mitigation for impacts to 0.34 acres of seasonal wetlands caused by development of the Project. The created wetlands have been designed to ensure appropriate wetland hydrology and native wetland plant establishment, and result in the creation of approximately 0.54 acres of seasonal wetland habitat that will replace and/or exceed the functions and values of the approximately 0.34 acre of filled seasonal wetland through increased area and volume to better attenuate flood flows, increased coverage by native vegetation, protection from disturbances that will increase wildlife habitat value, and closer proximity to the Petaluma River for increased habitat complexity and sustainability as well as improvement of water quality.

Table 6-2 Wetland Features within the Project Area (acres)

	Existing Jurisdictional Area	Preserved	Lost	Created	Resulting Total
Seasonal Wetland	0.62	0.28	0.34	0.54	0.82 (+0.20)
			Proposed Replacement Ratio:		1.58 : 1

The Applicant is solely responsible for developing, implementing, maintaining and monitoring the proposed wetland creation activities associated with the Project, including providing the land; property management; compliance with local, state, and federal laws and regulations; implementation of habitat improvements; and monitoring and reporting on the success of the mitigation.

Local Consistency

The Project proposes to preserve the highest quality wetlands area on site and to create wetlands within the Petaluma River Plan Corridor (as part of the proposed project terracing) to mitigate for the loss of the low-quality wetlands at a greater than 1 to 1 ratio. The Project's approach regarding wetland avoidance, replacement and enhancement is consistent with the River Plan goals, such as those described above and at Chapter 8 of the River Plan.

Required Agency Permits and Approvals

The protocol-level wetland delineation for the Project site was conducted in 2012 (WRA, 2012), and the wetlands delineation was approved by the Corps of Engineers in January 2013. Based on that delineation, the Project's site's 0.62 acres of seasonal wetlands are considered "waters of the U.S.", and jurisdictional under Section 404 of the Clean Water Act as regulated by the Corps, and are also considered "waters of the State" and regulated by the Regional Water Quality Control Board, San Francisco District (RWQCB) under CWA Section 401 and/or Porter-Cologne Act.

The Project applicant will be required to obtain all required authorizations from the US Army Corps and RWQCB (as applicable) for the loss or disturbance of on-site seasonal wetlands resulting from development of the property.

- All proposed discharges of dredged or fill material occurring within the lateral extent of jurisdictional wetlands on the Project site will require Department of the Army authorization and the issuance of a permit under Section 404 of the Clean Water Act.
- All proposed discharge of fill material to wetlands will also require State Water Quality Certification pursuant to the federal Clean Water Act (CWA), including issuance of a permit under Section 401 as issued by the San Francisco Bay RWQCB. Such certifications may be issued in connection with U.S. Army Corps of Engineer (Corps) CWA section 404 permits, or may be issued for the discharge of fill material to wetlands outside the jurisdiction of the Corps.

Copies of applicable permits shall be obtained by the City of Petaluma prior to issuance of a grading permit, and the Project applicant shall implement all avoidance and minimization measures as required by these agency authorizations.

Mitigation Measures

The following mitigation measures address the impacts of proposed grading and fill of on-site seasonal wetlands, and may be further clarified or expanded upon through the Corps and RWQCB permitting process.

Mitigation Measure Bio-4: Compensation for Seasonal Wetlands Fill. The Project applicant shall provide on-site compensatory mitigation sufficient to achieve a no-net-loss standard, subject to additional requirements of the permitting agencies. Compensatory mitigation shall be achieved through the creation, restoration and enhancement of wetland habitat acreage at appropriate locations within the Project site, providing new, higher quality wetlands habitat value than the low value habitat lost as a result of Project fill and terrace grading.

a) Compensatory wetland habitat shall ensure no net loss of habitat functions and values.

b) Compensatory ratios shall be based on site-specific information and determined through coordination with the Corps and RWQCB.

c) A Restoration and Monitoring plan for the compensatory wetlands shall be developed and implemented by the applicant. The Restoration and Monitoring Plan shall describe how the new wetlands shall be created and monitored over a minimum establishment period of five years.

Resulting Level of Significance

With implementation of the identified mitigation measure, the City will ensure that wetland mitigation fully compensates for the loss of wetland acreage and wetland habitat values resulting from the Project, such that there is no net loss of wetland acreage and values. The recommended compensation for the Project's impacts on seasonal wetlands, as provided for under the Project's proposed HMMP, would result in replacing or providing substitute resources that are out-of-kind, but on-site. Each of the upland area seasonal wetlands that would be lost as a result of the residential Project are generally of low quality and provide limited habitat for wildlife. The replacement of these seasonal wetlands with compensatory higher value wetland habitat would benefit species of concern, and would be a desirable alternative to in-kind off-site mitigation. The very small wetlands along the bank of the river (.01 acres) would be lost to create the flood terrace and would be replaced with similarly sited wetlands of larger area. With implementation of mitigation measures, impacts to seasonal wetlands would be fully compensated for, such that the resulting impact would be less than significant.

As indicated above, the Project applicant will be required to obtain all required permits and authorizations from the US Army Corps and RWQCB for the loss or disturbance of on-site seasonal wetlands resulting from development of the Project. The mitigation measures identified above are the City of Petaluma's baseline mitigation requirements (as lead agency). Subsequent permit requirements may result in different (potentially greater) mitigation obligations, particularly regarding compensatory mitigation ratios, which shall be based on site-specific information and determined through coordination with the Corps and RWQCB.

Riparian Habitat

Bio-5: The Project's proposed terraced grading plan for the banks of the Petaluma River would result in substantial adverse effects on riparian habitat. (**Less than Significant with Mitigation**)

Riparian scrub vegetation occurs along the Petaluma River and extends approximately 50 to 100 feet out from the center of the River channel onto the adjacent floodplain terrace, covering approximately 1.92 acres of the site. The vegetation consists primarily of thickets of willow, blackberry and teasel. The three general vegetation types present in these riparian areas are:

- Red willow riparian thickets are situated on and above the banks of the Petaluma River and may contain other riparian species including sandbar willow, arroyo willow, box elder and blue elderberry.
- In areas adjacent to willow riparian thicket, non-native Himalayan blackberry is dominant and forms homogenous stands along the River.
- In more permanent water of the River there are occasional patches of tules that include hardstem bulrush, California bulrush and cattail.

The functions and values of these riparian scrub habitats along the River range from low to high. The flood attenuation potential for these habitats and their respective topography is low. The dense vegetation along the river does rate high for riverbank protection and preventing erosion, and also serves to improve water quality by reducing toxicants and excess nutrients in the water. As habitat value, the patches of non-native Himalayan blackberry rate lower because they are generally homogeneous stands and nearly impenetrable to most species of wildlife. The willows and other native vegetation have a high rating for wildlife habitat value. The dense vegetation also contributes a high amount of primary production with gradual decomposition that provides a steady food chain source in the Project area and downstream.

The riparian habitat is fully contained within the River bank and below the top of slope, and the Project's proposed development area is set back from the top of slope. Therefore, development of apartment complexes, roadways and associated improvements would not adversely affect the riparian habitat. However, the Project also includes a Petaluma River terracing plan that proposes to re-contour the area along the western bank of the Petaluma River to improve flood capacity and flow efficiency. Construction of the proposed terrace will entail removal of existing Himalayan blackberry and some tree removal, followed by bank grading and re-contouring to achieve a floodway and floodplain terrace adequate to attenuate flood flows. The River terracing project will remove approximately 1.62 acres of riparian habitat during grading, most of which is considered lower quality non-native Himalayan blackberry vegetation. Approximately 0.30 acres of higher quality native riparian vegetation (determined by the presence of native woody species that are well established and in good health and structure, and being a native willow thicket) along the River would be avoided, where practical without severely diminishing the hydraulic flood flow capacity of the terracing project.

Project's Proposed Habitat Mitigation and Monitoring Program

The Project's proposed HMMP includes, among other goals, preservation of existing highest value habitat along the river (such as established, healthy, and well positioned native riparian species and existing seasonal wetlands), removal of invasive monocultures of Himalayan blackberry patches, creation and restoration of riparian habitat to, at a minimum, maintain beneficial functions and values, and revegetation of the graded and re-contoured terrace area with native riparian vegetation.

The proposed terrace grading will remove wide areas of existing non-native Himalayan blackberry along the river, as well as smaller areas of native riparian vegetation. Terrace grading will also extend into the non-native annual grassland vegetation along the edge of the uplands, west of the existing riparian habitat. However, the terraced grading plan is specifically designed to avoid and preserve approximately 0.30 acres of higher value native willow thicket along the River. Following grading activities,

approximately 2.08 acres of graded slopes will be replanted with riparian trees and shrubs, and an additional area of 0.71 acres along the River will be planted with marsh/wetland plants, for a total of 2.79 acres of replanted riparian habitat. With the 0.30 acres of avoided high quality riparian habitat, the total result of on-site riparian habitat will be 3.09 acres (see **Table 6-3**).

Table 6-3: Status of Riparian Features within the Project Area (acres)

	Existing Jurisdictional Area	Preserved	Lost	Created / Restored	Resulting Total
Riparian habitat	1.92	0.30	1.62	2.79	3.09 (+1.17)
			Proposed Replacement Ratio:		1.7 : 1

Willows (including sandbar willow, red willow, and arroyo willow) that currently exist within the riparian zone will be sourced for species harvesting to revegetate the newly established riparian areas. Riparian plants to be installed following grading activities along the existing riparian corridor and along the new terraced floodplain will restore more a higher average percent cover of riparian canopy than currently exists. In addition to planting of riparian vegetation, wetland plants will be planted in lower elevation zones along the river. There could be residual salt in subsurface soils remaining from when this reach of the Petaluma River was more tidal than it is currently, so some of the plants in the planting palette have been selected because they are salt tolerant (halophytes). Soil sampling and testing may confirm presence or absence of saline soils, and the plant palette may need to be adjusted accordingly based on test results. To augment those existing trees that will be avoided and preserved, replacement of removed trees will include installing new trees and shrubs in positions in the ecotone between the proposed for development uplands and the riparian and wetlands mitigation habitat areas, creating a transition between the two habitat types.

Required Agency Permits and Approvals

The total of approximately 1.92 acres of riparian scrub habitat present along the Petaluma River within the Project site are subject to jurisdiction under Fish and Game Code 1602 as regulated by California Department of Fish and Wildlife (CDFW). The Project applicant will be required to obtain all required authorizations from the CDFW (as applicable) for the loss or disturbance of on-site riparian vegetation resulting from development of the property. Any substantial change or use of any material from the bed, channel or bank of the River, or any change that may substantially adversely affect existing fish or wildlife resources will require CDFW issuance of a Streambed Alteration Agreement pursuant to Fish and Game Code 1602.

Copies of applicable permits, authorizations and agreements shall be obtained by the City of Petaluma prior to issuance of a grading permit, and the Project applicant shall implement all avoidance and minimization measures as required by these agency authorizations.

Mitigation Measures

The following mitigation measures shall be implemented to ensure implementation of proposed plans for avoidance and restoration of riparian habitat within the Petaluma River floodway.

Mitigation Measure Bio-5A: Riparian Preservation Zone. Final grading plans for the Project's proposed terraced grading concept along the Petaluma River shall show a Riparian (Willow) Preservation Zone of a minimum of 0.30 acres in size, where the preservation of existing high-quality riparian vegetation shall be achieved, while still accommodating an overall widened channel design that provides acceptable flood control containment. As the River Plan calls for all development (including grading and flood control alterations) to be severely restricted within the high priority Riparian Preservation Zone, all development, including trails, grading and flood control alterations, shall be prohibited in this Zone. (Minimal intrusions in a carefully selected location could be authorized by the City for interpretive purposes only.)

Mitigation Measure Bio-5B: Riparian Tree Preservation. Special measures to protect riparian and oak woodland trees within and abutting the riparian zone, as that zone is expanded by the river terracing project (including trees 65/106/107, 66, 68, 70-73, 209- 212, and 205-208, and the 0.30-acre willow thicket designated as the Riparian [Willow] Preservation Zone), such as temporary fencing, shall be required for river terracing and riverside path construction.

Mitigation Measure Bio-5C: Habitat Mitigation and Monitoring Plan. A final Habitat Mitigation and Monitoring Plan (HMMP) shall be submitted for review and approval by the regulatory agencies and the City. The City shall authorize the HMMP prior to issuance of the terrace grading plans. The Final HMMP shall be implemented.

The HMMP shall include a landscape and biological restoration plan prepared and signed by a licensed landscape architect, either experienced in environmental restoration or with appropriate consultation and input from wetlands biologists, soil scientists and hydrologists. The goals and objectives for the HMMP must be clearly stated, and the plans must be developed based on a thorough analysis of existing biologic, soils, and hydrologic conditions, including a consideration of the historic plant community.

a) When stabilized and restored, the Restoration Zone shall be designed and constructed such that it contributes significantly to the wildlife and fishery habitat values and water quality of the greenway.

b) Restoration treatments shall include re-grading, slope stabilization and planting with genetically local native riparian and upland species.

c) Access shall be generally restricted from the banks and bank-top areas in this zone, except at carefully selected and controlled points where overlooks and interpretive areas are permitted.

Resulting Level of Significance

With implementation of the required mitigation measures above, the City will ensure the preservation of the maximum extent of riparian habitat while balancing the need for expanded floodway capacity within the Petaluma River. The required HMMP would result in restoration of in-kind and on-site habitat of comparable habitat value to the riparian habitat that currently exists. With implementation of identified mitigation measures, impacts to riparian habitat could be avoided to the extent feasible, and would be mitigated with compensation through post-grading restoration, such that the resulting impact would be less than significant.

As indicated above, the Project applicant will be required to obtain all required permits and authorizations from the CDFW for proposed alterations to the Petaluma River, including temporal loss of

riparian habitat. The mitigation measures identified above are the City of Petaluma's baseline mitigation requirements (as lead agency). Subsequent permit requirements may result in different (potentially greater) mitigation obligations, particularly regarding compensatory mitigation ratios, which shall be based on site-specific information and determined through coordination with the CDFW. Assuming that these necessary permits and approvals are obtained, and their requirements are incorporated as components of, or conditions of approval for grading permits, potential impacts on riparian habitat would be reduced to a level of less than significant.

Waters of the U.S.

Bio-6. The Project would result in potentially substantial adverse effects on the aquatic habitat within the Petaluma River, potentially interfering with the movement of native resident and migratory fish. (**Less than Significant with Mitigation**)

The wetlands delineation as approved by the Corps of Engineers in 2013 identified a total of 1.26 acres of waters of the U.S., jurisdictional under Section 404 of the Clean Water Act (CWA) and regulated by the Corps, which includes 0.92 acres of non-wetland waters also regulated under Section 10 of the Rivers and Harbors Act. These non-wetland waters are also considered Waters of the State and regulated by the Regional Water Quality Control Board, San Francisco District (RWQCB) under CWA Section 401 and/or Porter-Cologne Act.

Construction of the Project's proposed terraced grading plan along the banks of the Petaluma River is designed to avoid direct disturbance to river waters habitat. Construction activities will be confined to occur above the ordinary high-water mark (OHWM) of the Petaluma River. Temporary equipment staging areas will be established in upland areas during Project construction. However, proposed terrace grading activity within the Petaluma River floodway could result in the disturbance of jurisdictional non-wetland waters. These areas could be indirectly affected through hydrological interruption, alteration of bed and bank, increased sedimentation, and other construction-related activities. This impact would be temporary during the grading process.

Project's Proposed Habitat Mitigation and Monitoring Program

The Project's proposed HMMP includes, among other goals, increasing the extent of aquatic habitat in the Petaluma River by grading and re-contouring the western bank of the River and creating new floodplain terraces. This is intended to be accomplished by grading areas along the banks of the river to elevations appropriate for wetland and riparian habitat formation. Equipment used will include standard construction equipment such as a long arm excavator and a front-end loader. Erosion control measures (such as silt fencing, straw wattles, and straw bales) will be implemented to conform to best management practices (BMPs) as required by the RWQCB.

Required Agency Permits and Approvals

The Project applicant will be required to obtain all necessary authorizations from the U.S. Army Corps, the RWQCB, the California Department of Fish and Wildlife, and other regulatory agencies with jurisdiction (as applicable) for the disturbance of waters of the U.S. and their associated aquatic habitat.

- All proposed discharges of dredged or fill material to the Petaluma River will require Department of the Army authorization and the issuance of a permit under Section 10 of the Rivers and Harbors Act, which is anticipated to be a nationwide permit for impacts on other waters. The applicant shall comply with all the terms and conditions within the nationwide permit. In addition, the City of

Petaluma would have to comply with the NPDES General Construction Permit regulations, implement a SWPPP, and implement spill prevention and controls measures, as appropriate.

- State Water Quality certification, pursuant to the Porter-Cologne Act as issued by the San Francisco Bay RWQCB, shall be required for any direct removal, filling or hydrological interruption to the River, or other effects on water quality. In addition, the applicant shall comply with NPDES General Construction Permit regulations, implement a SWPPP, and implement spill prevention and controls measures, as appropriate.
- Any alterations to the Petaluma River streambed may also require a Streambed Alteration Agreement issued by the California Department of Fish and Wildlife, pursuant to Section 1602 of the Fish and Game Code.

Copies of applicable permits, authorizations and agreements shall be obtained by the City of Petaluma prior to issuance of a grading permit, and the Project applicant shall implement all avoidance and minimization measures as required by these agency authorizations.

Mitigation Measures

In addition to all mitigation measures identified above related to protection of special-status species, wetlands and riparian areas, the following additional mitigation measure is recommended to reduce and/or avoid indirect effect to aquatic habitat during construction:

Mitigation Measure Bio-6: Terraced Grading Erosion Control/Stormwater Pollution Prevention Plan. The Project applicant shall prepare and implement a specific Terraced Grading Erosion Control Plan for all terrace grading work and trail construction within and abutting the Petaluma River floodplain. The discharge or creation of potential discharge of any soil material including silts, clay, sand, or any other materials to the waters of the State is prohibited.

a) Install and maintain silt fences adjacent to the perimeter of the work area and immediately downstream of disturbed areas, and install and maintain erosion control blankets on all disturbed ground to prevent inadvertent transport of sediments into the Petaluma River. The Project applicant shall be responsible for ensuring that sediment-control devices are installed and maintained correctly. The devices shall be inspected frequently (e.g., daily) to ensure they are functioning properly. Controls shall be immediately repaired or replaced, or additional controls shall be installed as necessary. Sediment that is captured in these controls may be disposed of onsite in an appropriate approved area, or off-site at an approved disposal site.

b) Soil materials stockpiled at the site must be covered with plastic sheeting at the end of each workday until permanently protected with rock ballast materials.

c) Spill prevention and control BMPs shall be implemented throughout grading activities. Train onsite personnel in spill prevention practices, and provide spill containment materials near all storage areas. All contractors are responsible for familiarizing their personnel with the information contained in the Storm Water Pollution Prevention Plan.

d) Spills, leaks, and other problems of a similar nature shall be resolved immediately to prevent unnecessary impacts. A plan for the emergency cleanup of any spills of fuel or other material shall be available on-site, and workers shall be trained in techniques to reduce the chance for spills, contain and clean up spills, and properly dispose of spilled materials for the potential pollutants. Adequate materials for spill cleanup shall be maintained on-site and

readily available to the employees of each contractor or subcontractor for immediate response should a spill occur on-site.

e) Maintain all construction equipment to prevent oil or fluid leaks, use drip pans or other secondary containment measures beneath vehicles during storage, and regularly inspect all equipment and vehicles for fluid leaks.

f) Water down all disturbed ground surfaces as necessary to minimize windblown dust.

g) Fuel and service vehicles and equipment that are used during the course of the proposed grading operation, and park all grading equipment overnight on the upland portion of the site and in a safe area outside of sensitive habitats. Wash vehicles and equipment off-site.

h) Implement the HMMP immediately after grading operations are complete to re-vegetate all disturbed areas.

Resulting Level of Significance

With implementation of the required mitigation measures above, the City will minimize potential adverse effects to aquatic habitat within the Petaluma River associated with proposed grading along the riverbanks. As indicated above, the Project applicant will be required to obtain all required permits and authorizations from applicable regulatory agencies. The mitigation measures identified above are the City of Petaluma's baseline mitigation requirements (as lead agency). Subsequent permit requirements may result in different (potentially greater) mitigation obligations based on site-specific information and determined through agency coordination. Assuming that these necessary permits and approvals are obtained, and their requirements are incorporated as components of, or conditions of approval for grading permits, potential impacts on aquatic non-wetland habitat would be reduced to a level of less than significant.

Native Resident or Migratory Wildlife Corridor

Bio-7: The Project could interfere substantially with the movement of native resident or migratory wildlife species, or with established native resident or migratory wildlife corridors along the Petaluma River. (**Less than Significant with Mitigation**)

The increased presence of people (Project residents and visitors), as well as outdoor lighting associated with new development and potential lighting along the proposed trail adjacent to the Petaluma River corridor may adversely affect the behavior of nocturnal animals using the River's riparian corridor for cover or foraging. Outdoor lighting used along access trails can be associated with a number of adverse effects on animals if light emitted by such installations falls or spills outside the targeted area or boundary of the trail edge. It is well documented that some insects such as moths, are photo-tactic (attracted by light), while others, such as fireflies, are lucifugal (dislike, and, therefore, avoid light). For both of these types of insects, the effects of nighttime lighting may be significant. Additionally, the spill lighting adjacent to tree cover, such as the Project site's riparian habitat and abutting oak woodland, has been implicated in adverse behavioral changes to migratory and nocturnal animals such as owls and raccoons.

The Project's proposed trail is aligned such that it does not encroach into areas of existing riparian habitat that will be preserved (the Riparian (Willow) Preservation Zone). The riverside path is proposed to extend into the HMMP area, and into the Preservation and Restoration Zones of the River Plan. The River Plan Design Guidelines' stated intent regarding lighting is to protect the naturalness of the river

plan corridor, continuing that some portions of the river trail may remain lit; lighting of the river trail shall be further considered as part of the SPAR review.

Grading of the floodway terrace adjacent to the Petaluma River, and trimming and clearing vegetation next to and within the River may temporarily hinder the migration of aquatic and riparian wildlife species. The most significant potential impacts include the disturbance of nesting migratory songbirds (see further discussion under Impact Bio-3), and disturbance of aquatic habitat for Sacramento split-tail, juvenile steelhead trout, or Chinook salmon, which may use this reach of the River (see further discussion under Impact Bio-4). This is a potentially significant impact.

Mitigation Measures

The following mitigation measures are recommended to reduce and avoid substantial interference with wildlife movement within the Petaluma River corridor.

Mitigation Measure Bio-7A: Hooding or Shielding of Outdoor Lighting Fixtures. All outdoor lighting including any lighting along the river trail shall be focused and directed to the specific location intended (e.g., walkways, sidewalks, paths). Such fixtures shall be hooded or shielded to avoid the production of glare, minimize up-light, and light spill. All light fixtures shall be located, aimed, or shielded to minimize spill-light into the riparian corridor and associated trees; this shall be demonstrated as a component of SPAR review. (The River Plan Design Guidelines states that some portions of the river trail may be lit.)

Mitigation Measure Bio-7B: Pre-Construction Surveys (see Mitigation Measure Bio-1A). This measure requires pre-construction biological surveys and determination of avoidance measures as necessary during construction.

Mitigation Measure Bio-7C: Avoidance and Minimization (see Mitigation Measure Bio-3). This measure requires avoidance and minimization measures to be employed prior to and during all grading and construction activities within the Petaluma River, as required and/or approved by subsequent permitting agencies, to protect special status species and sensitive habitats. These measures include, but are not limited to restricting grading operations to the dry season (between June 15 and October 15) when low flow conditions are present in the River, and restricting vegetation removal to the period of June 15 to November 15 to avoid potential impacts to anadromous fish species and nesting birds.

Resulting Level of Significance

Implementation of Mitigation Measure Bio-8A would reduce the environmental impacts of nighttime lighting on native riparian habitat to a level of less than significant.

Implementation of Mitigation Measures Bio-8B and -8C are dependent upon the review and approval of several subsequent permitting agencies including the US Army Corps of Engineers, the San Francisco Regional Water Quality Control Board, and the California Department of Fish and Wildlife. The City will not issue grading permits for work within the Riverbanks prior to the applicant obtaining all necessary resource agency permits and approvals, including the incorporation of all subsequent conditions and requirements of these agency approvals into the proposed grading plans. Assuming that these necessary permits and approvals are obtained, and their requirements are incorporated as components of, or conditions of approval for grading permits, potential impacts on aquatic and riparian wildlife corridors would be reduced to a level of less than significant.

Habitat Conservation Plan

Bio-8. The Project would not conflict with the provisions of an adopted Habitat Conservation Plan, Natural Community Conservation Plan, or other approved local, regional, or state habitat conservation plan. (**No Impact**)

There are no Habitat Conservation Plans, Natural Community Conservation Plans, or other approved local, regional, or state habitat conservation plans that apply to the Project site. Therefore, the Project would have no impact with the provisions of such plans.

Mitigation Measures

None required.

Invasive Species

Bio-9: Implementation of the Project could result in a substantial adverse effect on riparian habitat through the introduction of invasive, non-native plants. (**Less than Significant with Mitigation**)

New landscaping associated with the proposed residential development adjacent to the Petaluma River corridor could introduce invasive, low habitat value plant species to the riparian corridor. Invasive plants pose an increasing threat to native riparian habitats. These plants are capable of rapidly taking over native riparian areas. In general, native wildlife species are not adapted to use these exotic species for food or shelter. The invasion by exotic species can severely degrade the value of riparian areas for wildlife.

Mitigation Measures

The following mitigation measures are recommended to reduce and avoid the introduction of invasive, non-native plants into on-site and adjacent riparian habitats.

Mitigation Measure Bio-9: Incorporation of Native Plants in Landscaping Plans. As part of the Project's Site Plan and Architectural Review process, the Project applicant shall submit a Landscape Plan for review and approval by the City. The landscape Plan shall incorporate planting of native trees and ground cover plants consistent with the goals and objectives for this reach of the River as described in the Petaluma River Access and Enhancement Plan.

a) The Landscape Plan shall only include plants from the City's approved list of commonly occurring native riparian plant species for landscaping proposed within the Petaluma River Preservation and Restoration zones.

b) In the Buffer Zone (including 200 feet from the River centerline and its extension 50' from oak drip lines and wetlands and 30' from constructed river terrace top of bank), the Landscape Plan shall incorporate riparian buffer zone plantings as recommended from the City of Petaluma's approved list (including River Plan page 165 and Chapter 5, Table 1). The planting objectives in this riparian buffer will be to minimize removal of native vegetation and re-plant, where appropriate, with native plants species.

c) Landscaping within the River Oriented Development Zone (i.e., the Project's upland development area on existing APN -009) shall include use of "compatible" plants, as defined in the River Plan (Chapter 5, Tables 1 and 2).

d) Although not included as part of the River Plan's River Oriented Development Zone, landscaping within existing APN -006 should be similar to that in the RODZ.

Per Mitigation Measure, Bio 1-5C, a final HMMP shall be submitted for review and approval by the City along with the proposed terrace grading plans for the Project. Goals and objectives for the plan must be clearly stated and the plan must be developed based on a thorough analysis of existing biologic, soils, and hydrologic conditions, including a consideration of the historic plant community.

Resulting Level of Significance

A detailed Landscape Plan shall be submitted and reviewed as a component of the Site Plan and Architectural Review Implementation of this mitigation measure will reduce potential impacts due to the introduction of non-native species to less than significant levels.

Local Policies and Regulations: Petaluma River Plan Corridor

Bio-10: The Project could conflict with local policies and ordinances protecting biological resources, including the City's Petaluma River Plan Corridor. (**Less than Significant with Mitigation Measures**)

The Project's consistency with the General Plan and Petaluma River Access and Enhancement Plan regarding the Petaluma River and its abutting natural resources is discussed above.

As noted above, the Project's proposed development plan for new apartments encroaches into the Preservation Zone for oak woodland habitat at the River and into the Buffer Zone designated by the River Plan. The conceptual site plan shows approximately three apartment buildings extending into the Petaluma River Plan Corridor (the area at the River comprised of the River Plan's 3 management zones; the area needed to implement the River Plan) and calls for removal of 4 native oaks and 1 small native bay (trees 69, 74, 75, 77, and 79) from the Preservation Zone to accommodate the residential project. Encroachment into the River Plan Corridor and the proposed removal of habitat within the River Plan Corridor to accommodate residential development conflicts with River Plan policies related to the protection of biological resources.

The proposed conceptual site plan does not fully comply with the River Plan's RODZ Policies and Design Guidelines and therefore presents a potentially significant impact.

Mitigation Measures

The following mitigation measures shall be implemented to ensure that the Project is consistent with the City's River Access and Enhancement Plan.

Mitigation Measure Bio-10A: Preclude Residential Development from intruding into the Petaluma River Plan Corridor. No portion of the residential component of the Project shall extend into the Petaluma River Plan Corridor (comprised of the Preservation, Restoration, and Buffer management zones of the River Plan; see Corridor mapped at Figure 6-6). (See also Bio-11A) Only River Plan Corridor components shall be allowed with the Corridor including the river trail, terracing and restoration.

Mitigation Measure Bio-10B: RODZ review at SPAR. The Site Plan and Architectural Review process shall include evaluation and review of the Project for consistency with River Oriented Development Zone (RODZ) policies and design guidelines. (See River Plan page 79-80 and Chapter 9: Design Guidelines.) As the concept plan for the apartment project is fully detailed for

Site Plan and Architectural Review, the northern portion of the Project that is within the RODZ (APN -009) shall be designed pursuant to the RODZ Guidelines.

Local Policies and Regulations: Tree Removal and Tree Protection

Bio-11: The Project could conflict with local policies and ordinances protecting biological resources, including the City's tree preservation policies and ordinance. (**Less than Significant with Mitigation Measures**)

A tree inventory and evaluation was conducted on the Project site in December 2003, updated first in September 2004, then updated again in December 2015, and then again in May and August 2016.[17, 18] All trees over 4 inches in diameter at the time were measured, identified and evaluated. They were also tagged in the field with numbers which relate to the Tree Inventory report. A total of 103 individual trees located within or extending into the Project site, including the terrace area, were surveyed. The survey identified the species, trunk diameter, general health characteristics and structural integrity of each tree, and provided an indication of whether each tree would be preserved or removed as part of the Project.

Of the 103 on-site trees inventoried, 40 trees are proposed for preservation. Eighteen of these trees have canopies that extend onto the Project site, but trunks are located outside of the Project site or straddling an exterior property (these include 5 oaks on the Oak Creek Apartment site, 2 redwood and 4 alders within the landscaped turn-around (recently proposed by the project to remain, APN-008), as well as 3 cypress and 3 oaks either on the abutting rail line property or on that shared property line (most of the rail line trees have been previously burned), as well as 1 oak on the property line shared with 42 /44 Graylawn (oak 14)). Generally, the 22 trees proposed to be preserved on the Project site are located outside of the areas proposed for development of new apartment complexes and roadways, along the Project site peripheries, or in areas that would incur no impacts from construction. The three locations where tree preservation is proposed are: the southern portion of the site near Bernice Court (those being 1 oak and 3 black walnuts), most of the existing trees closest to the Petaluma River banks (those being 13 oaks and a cluster of 4 box elders), and one valley oak in the interior of the site where proposed development has been designed to accommodate its preservation. Project design efforts seek to:

- Avoid sidewalk placement over the root zone of trees to ensure preservation (particularly at trees 39, 63, 66, and 205-208);
- In the interior location, building footprints, grading, utility corridors and sidewalk locations have been shifted to preserve specimen oak 38.

Conversely, 63 of the 103 total on-site trees are either recommended by the arborists to be removed, or would need to be removed to accommodate the Project. An overview of the reasons for proposed tree removal associated with the Project includes:

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[17] Duckles, Becky, Landscape Consultant and Arborist, *Tree Inventory and Evaluation*, updated September 15, 2004

[18] Duckles, Becky. Sid Commons, Petaluma, CA, Tree Removal and Mitigation Calculations, December 9, 2015, May 16, 2016.

- Twelve (12) of the 63 trees to be removed are non-protected trees recommended for removal by the arborist because they are dead, in poor health or have poor structural integrity. This group includes six Bailey acacias which are in poor condition located behind the homes on Bernice Court, five Monterey cypress located along the rail tracks that have burned and been repeatedly topped, and one dead sycamore.
- Two (2) Valley oaks are proposed to be removed in order to create the required terraced banks along the Petaluma River. (The terrace design preserves 24 oak and riparian trees as well as a significant clump of willows; furthermore, proposed revegetation of the terrace is extensive; see HMMP at Fig 6-7.)
- The other 49 trees are proposed for removal to accommodate new construction of apartment buildings and on-site roadways. Included within this list of trees to be removed for construction are 23 additional Valley oaks, 2 Coast live oaks, 11 Coast Redwoods, and 13 other non-protected tree species including eucalyptus, box elder, olive, Western redbud, and smaller redwood and California bay laurel trees not qualifying as protected trees, as indicated on **Table 6-4.**

Table 6-4. Trees Slated for Removal

Tree #	Species	Diameter (In.)	General Health	Structural Integrity	Comments/Recommendations
Protected Trees Proposed for Removal					
Within River Plan Corridor (within 200 feet of River centerline, plus a Buffer Zone extension of 50 feet from dripline of mature Oaks and existing wetlands and at least 30 feet from the Restoration zone/graded terrace: north end of APN-009)					
67	Valley Oak/*Quercus lobata*	36"	Good	Good	To be removed to create river terrace
69	Valley Oak/*Quercus lobata*	26"	Good	Good/Excellent	To be removed for construction
75	Valley Oak/*Quercus lobata*	27"	Fair	Fair	Fire damage (old); to be removed for construction
77	Valley Oak/Quercus lobata	28"	Fair/Good	Good	Beehive in base of trunk (cavity); 24' canopy radius to south; to be removed for construction
79	Valley Oak/*Quercus lobata*	11"	Good	Good	To be removed for construction
80	Valley Oak/*Quercus lobata*	23"	Good	Good/Excellent	To be removed to create river terrace
Within River Oriented Development Zone (i.e. within existing APN-009, excluding the River Plan Corridor)					
36	Valley Oak/Quercus lobata	37"	Good	Good/Excellent	To be removed for construction
37	Valley Oak/Quercus lobata	24"	Fair	Fair/Good	Burned; would be removed for construction
59	Valley Oak/Quercus lobata	34"	Good	Good	Leans east; low-branched to SE; to be removed for construction
60	Valley Oak/Quercus lobata	36"	Good	Good/Excellent	To be removed for construction

Table 6-4. Trees Slated for Removal

Tree #	Species	Diameter (In.)	General Health	Structural Integrity	Comments/Recommendations
61	Valley Oak/Quercus lobata	21"	Good	Good	To be removed for construction
62	Valley Oak/Quercus lobata	18/20/24"	Good/Excellent	Good/Excellent	To be removed for construction
85	Coast Redwood/Sequoia sempervirens	19"	Good/Excellent	Good/Excellent	Presumed to be removed for construction, but may be preservable with retention of the landscaped turn-around as now proposed by the project; sited on Oak Cr Apt -007
101	Coast Live Oak/Quercus agrifolia	5/9"	Excellent	Good	To be removed for construction (near tree #38)
202	Valley Oak/*Quercus lobata*	5"	Excellent	Good	To be removed for Shasta Ave. extension
Outside River Oriented Development Zone (i.e., within existing APN -006, southern portion of Project area)					
1	Valley Oak/Quercus lobata	23"	Good	Good/Excellent	Low-branched, dripline 24' diameter; to be removed for EVA
2	Valley Oak/Quercus lobata	23"	Good/Excellent	Good/Excellent	Outside zone of construction impact; to be removed for EVA
13	Valley Oak/Quercus lobata	11/8"	Good/Excellent	Good	To be removed for construction
17	Valley Oak/Quercus lobata	20"	Good	Good	Epicormic growth; small branch dieback; 25' canopy diameter; to be removed for road grading
39	Valley Oak/Quercus lobata	9/11/12"	Fair/Good	Fair	To be removed for construction
40	Valley Oak/Quercus lobata	15"	Good	Good	To be removed for construction

Table 6-4. Trees Slated for Removal

Tree #	Species	Diameter (In.)	General Health	Structural Integrity	Comments/Recommendations
41	Valley Oak/Quercus lobata	6/7"	Fair/Good	Fair/Good	To be removed for construction
42	Coast Redwood/Sequoia sempervirens	21"	Good/Excellent	Excellent	To be removed for construction
43	Coast Redwood/Sequoia sempervirens	24"	Excellent	Excellent	To be removed for construction
44	Coast Redwood/Sequoia sempervirens	25"	Excellent	Excellent	To be removed for construction
46	Coast Redwood/Sequoia sempervirens	25"	Good	Good/Excellent	To be removed for construction
47	Coast Redwood/Sequoia sempervirens	26"	Good/Excellent	Good	To be removed for construction
48	Coast Redwood/Sequoia sempervirens	26"	Good/Excellent	Good/Excellent	To be removed for construction
49	Coast Redwood/Sequoia sempervirens	18"	Good/Excellent	Good/Excellent	To be removed for construction
50	Coast Redwood/Sequoia sempervirens	21"	Good/Excellent	Good/Excellent	To be removed for construction
52	Coast Redwood/Sequoia sempervirens	21"	Good/Excellent	Good/Excellent	To be removed for construction
53	Coast Redwood/Sequoia sempervirens	18"	Good	Good/Excellent	To be removed for construction

Table 6-4. Trees Slated for Removal

Tree #	Species	Diameter (In.)	General Health	Structural Integrity	Comments/Recommendations
100	Valley Oak/Quercus lobata	6/7/9"	Fair/Good	Fair/Good	To be removed for construction (near tree #17)
102	Valley Oak/Quercus lobata	5/6"	Good	Good	To be removed for construction (near tree #40)
103	Valley Oak/Quercus lobata	9"	Good	Good	To be removed for construction (near tree #42)
104	Valley Oak/Quercus lobata	8"	Excellent	Excellent	To be removed for construction (near tree #49)
200	Coast Live Oak/Quercus agrifolia	11,13,13,14"	Good/Excellent	Good (low-branched, multi-trunk)	To be removed for construction
201	Valley Oak/Quercus lobata	4"	Poor: extensive branch dieback	Poor	To be removed for construction; though protected, it is in poor condition and requires no mitigation
Non-Protected Trees Proposed for Removal					
5	Bailey Acacia/Acacia baileyana	5"	Good	Good	Preservable tree, but undesirable, non-protected species; outside zone of construction impact
7	Bailey Acacia/Acacia baileyana	6/7"	Poor	Poor	Part of a group of acacias in poor condition; 1 large tree down (almost dead); not recommended for preservation (not protected species)
8	Bailey Acacia/Acacia baileyana	4"	Fair	Poor	Not recommended for preservation

Table 6-4. Trees Slated for Removal

Tree #	Species	Diameter (In.)	General Health	Structural Integrity	Comments/Recommendations
9	Bailey Acacia/Acacia baileyana	10"	Fair	Poor	Not recommended for preservation
10	Bailey Acacia/Acacia baileyana	11/9/5"	Fair	Poor	Not recommended for preservation
11	Bailey Acacia/Acacia baileyana	13"	Fair	Poor	Not recommended for preservation
15	Olive/*Olea europaea*	11/14" @ 4'	Good/Excellent	Good	To be removed for construction; could be transplanted on site if desired; not a protected tree
18	California Sycamore/Platanus racemosa	24”	Dead/burned	Dead	Remove
20	Monterey Cypress/*Cupressus macrocarpa*	32"	Good	Poor	Very twisted, partially failed trunk; outside zone of construction impact
27	Monterey Cypress/*Cupressus macrocarpa*	24"	Poor	Poor	All these Monterey cypress trees have been repeatedly topped (past overhead line clearance) and are breaking up; many large scaffold branches and leaders have failed; several were burned; and should be replaced with more appropriate species for the new site use; many were badly burned in the fire; not a protected species; to be removed
28	Monterey Cypress/*Cupressus macrocarpa*	24"	Fair	Poor form	15% burned; removal recommended/shown
29	Monterey Cypress/*Cupressus macrocarpa*	26"	Poor	Poor	Removal recommended/shown
33	Monterey Cypress/*Cupressus*	22"	Dead/burned	NA	Trunk burned severely; extensive dieback;

Table 6-4. Trees Slated for Removal

Tree #	Species	Diameter (In.)	General Health	Structural Integrity	Comments/Recommendations
	macrocarpa				very little foliage; removal recommended
45	Western Redbud/*Cercis occidentalis*	4"	Poor	Poor	To be removed for construction
51	Coast Redwood/*Sequoia sempervirens*	10"	Good/Excellent	Good/Excellent	To be removed for construction
54	Coast Redwood/*Sequoia sempervirens*	15"	Good/Excellent	Good/Excellent	To be removed for construction
55	Coast Redwood/*Sequoia sempervirens*	15"	Good	Good/Excellent	To be removed for construction
56	Coast Redwood/*Sequoia sempervirens*	14"	Good	Good/Excellent	To be removed for construction
57	Coast Redwood/*Sequoia sempervirens*	13"	Good	Good/Excellent	To be removed for construction
58	Coast Redwood/*Sequoia sempervirens*	16"	Good/Excellent	Good/Excellent	To be removed for construction
74	California Bay Laurel/*Umbellularia californica*	Many 3-8" stems	Good	Poor (mult. trunks)	To be removed for construction
76	Blue Gum Eucalyptus/*Eucalyptus globulus*	37	Fair	Good	To be removed for construction
78	Box Elder/*Acer negundo*	4/5/6/6/8"	Poor	Poor	Main stem gone; all suckers; to be removed for construction
87	Coast Redwood/*Sequoia sempervirens*	17"	Fair	Good/Excellent	To be removed for construction

Table 6-4. Trees Slated for Removal

Tree #	Species	Diameter (In.)	General Health	Structural Integrity	Comments/Recommendations
88	Coast Redwood/*Sequoia sempervirens*	13"	Fair/Good	Good	To be removed for construction

Source: Sid Commons Tree Removal & Mitigation Calculations, Becky Duckles, Consulting Arborist & Landscape Advisor, May 2016; and Sid Commons Vesting Tentative Map, CSW/Stuber-Stroeh Engineering Group, latest update August 19, 2016

Protected Tree Removal

As indicated in the Setting section above, the City of Petaluma Tree Preservation Ordinance (IZO Section 17) contains a number of regulations that relate to the protection, preservation and maintenance of mature trees and that are directly applicable to the Project. Under this ordinance, oak trees of four inches or greater diameter (DBH), California or Coast Redwood (Sequoia) of eighteen inches DBH or greater, California bays with at least 1 trunk over 12" in diameter, significant groves or stands of trees, trees located in riparian areas, and any tree required to be planted or preserved as environmental mitigation or as a condition of approval for a discretionary development application or other development permit are considered "protected" trees. The Ordinance directs that the design of every development project shall recognize the desirability of preserving protected trees to the greatest extent possible.

Based on the tree survey conducted for the site, there are 68 trees that qualify as protected based on species type and size criteria, including 51 oaks, 13 redwoods and 4 riparian box elders. As assumed under the Project's proposed development plan, 38 of those trees protected by City ordinance are proposed to be removed, and 30 would be retained, as indicated in **Table 6-5**, and shown on **Figure 6-9**.

Table 6-5: Status of On-Site & Near-Site Protected Trees

Protected Species on and near Site	Total Protected Trees	Protected Trees Preserved[1]	Protected Trees Removed			
			Removed in River Plan Corridor	Removed in RODZ	Removed in APN - 006	Total Removed
Oaks	51	24	6	8	13	27
Redwoods	13	2	-	1	10	11
Box Elders at River	4	4	-	-	-	0
Total	68	30	6	9	23	38

[1] Note: Many Protected Trees Preserved are outside of the Project Site itself; for example 5 oaks are on the Oak Creek Apartment site, 2 redwoods are within the landscaped turn-around, and 3 oaks are on the railroad parcel.

Source: Becky Duckles, Oak Creek II Tree Inventory and Evaluation, revised September 2004; Sid Commons, Petaluma, CA. Tree Removal and Mitigation Calculations, Aug 2016

Review of the conceptual site plan showcases efforts to preserve specimen oak tree 38 in the center of the site as well as efforts to preserve numerous trees as part of the river terracing plan. The plans indicate efforts made to preserve oak 63 (that lies on the west property line) and oak 205 (that lies near the River and the Oak Creek Apartment property line). Otherwise the Project proposes to remove most Protected trees onsite; outside of those trees noted above and oak 16 (near 42/44 Graylawn Ave) the plan preserves only protected trees that are off-site, or on shared exterior parcel lines. In conclusion, while the conceptual site plan demonstrates that some effort was made to preserve protected trees, there is no evidence that this has occurred to the greatest extent possible as directed by the Tree Ordinance.

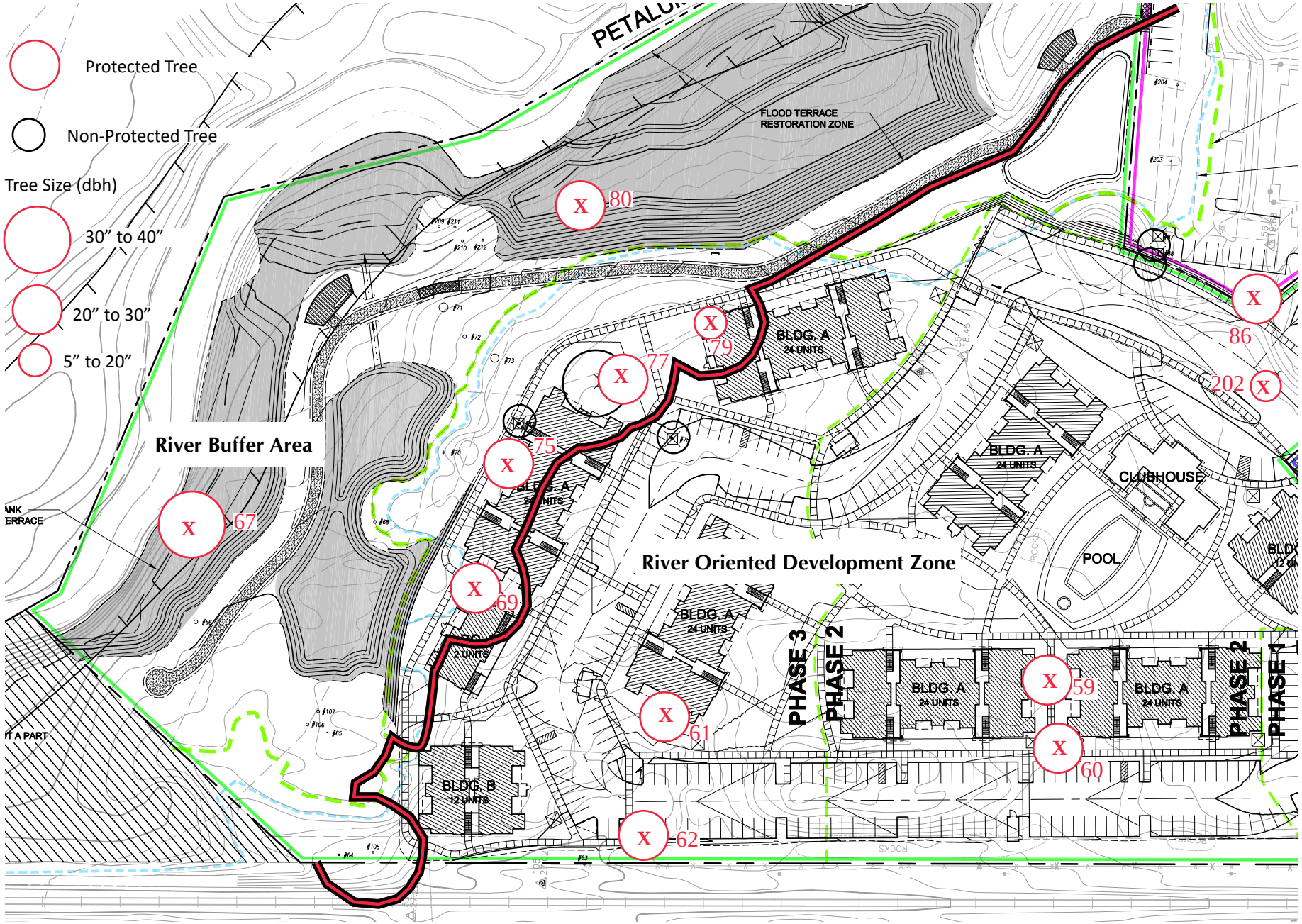

Figure 6-9A
Proposed Tree Removal, northerly portion of Project

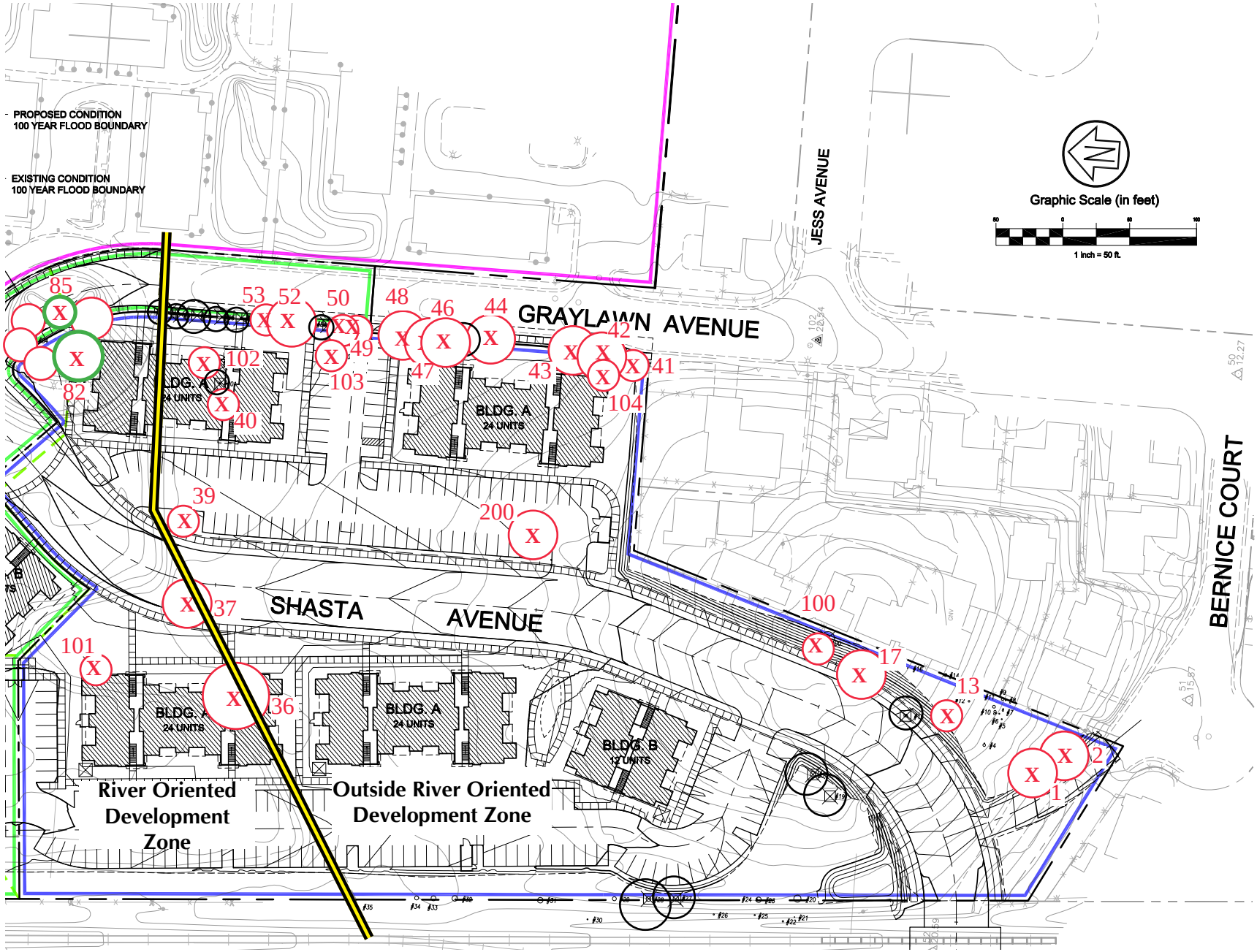

Figure 6-9B
Proposed Tree Removal, southerly portion of Project

Source: CSW/Stuber-Stroeh Engineering Group

Preservation of Remnant Oak Grove/Riparian Woodlands

The River Plan also indicates that the "last remaining vestige of the Petaluma River's oak woodlands and other mature riparian trees can be found in this reach [the reach form Corona Road to Lynch Creek, which passes through the Project site]. Clusters of mature Coast live oak, willow, and California box elder visible from Highway 101, mark the location of the river in contrast to the adjacent grassy fields." Because of this habitat's sensitivity to disturbance, the River Plan recommends "large preservation zones and limited public access to better protect the important plants and animals, allow natural re-growth of these magnificent trees, and recreate a bit of local natural history."

The Project site contains these oak woodlands and riparian woodlands (see Figure 6-1) discussed by the River Plan that mark the location of the river in contrast to the adjacent grassy field. These areas are designated as Preservation Zones by the River Plan. The River Plan also designates a Buffer zone extending 50' from drip lines of these oaks (and from existing wetlands and 30' from constructed river terrace top of bank). These zones are components of the Petaluma River Plan Corridor.

Protected Trees within Petaluma River Plan Corridor

Of the 27 total protected oak trees proposed for removal under the Project, 6 of these oak trees (tree survey numbers 67, 69, 75, 77, 79 and 80) are located within the Petaluma River Plan Corridor (that Corridor being the three management zones nearest the river: the Preservation, the Restoration, and the Buffer Zone). Of these 6, four oak trees are located in areas proposed for residential development (trees #69, 75, 77 and 79), and two oak trees are located within the Project's proposed conceptual terraced grading plan along the banks of the Petaluma River.

In addition to trees surveyed by the project arborist and discussed above, further trees at the River were collectively surveyed by WRA prior to design of the terrace plan. The conceptual terraced grading plan also shows that there are approximately five High Priority native tree canopies within the existing banks of the River that are proposed to be preserved. It also shows approximately 15 separate Lower Priority tree canopies and other riparian vegetation will also be preserved, or in the case of some of the willows and oaks (67 and 80) replanted in kind to accommodate the grading work necessary to create the terrace. Approximately 4 non-native trees at the riverbank and other non-native thickets, principally invasive monocultures of Himalayan blackberry, are to be removed as part of the terrace component of the Project (see Figure 6-6). Eucalyptus (tree #76) is recommended to be removed as it is an exotic species detrimental in the river corridor.[19]

The terrace plan was designed preservation of high priority riparian vegetation and the bulk of the area oak trees, though two oak trees are proposed for removal. While the River Plan directs flood protection alterations to occur in an environmentally sensitive manner, it anticipates that creation of a River terrace may necessitate some habitat removal, directing habitat avoidance were possible and habitat restoration generally. Loss of 8% of the trees within the River Corridor for the purpose of the river terracing directed by the General Plan does not appear inconsistent with River Plan policies. The Project's proposed development plan for new apartments require removal of another 4 oaks and 1 small native bay (oaks 69, 74, 75, 77, and 79) from the Preservation Zone. Removal of 5 additional trees from the Preservation Zone, those being 100% of all the trees within the Preservation Zone/River Corridor not

[19] The Restoration Design and Management Guidelines for the Petaluma River Watershed (1996) notes that this species of Eucalyptus, in addition to being fast growing and shading out and displacing native species, also produces allelopathetic substances that further discourage the establishment of native plants (pg. 7).

protected from residential development by location within the floodplain or by GP Policy 8-P-30 (200' distance from River centerline), to accommodate residential development, is in direct conflict with River Plan policies intended to protect biological resources.

RODZ Priority Preservation

The River Plan designates a River Oriented Development Zone upon that portion of APN -009 outside the Petaluma River Plan Corridor. Beyond the preservation of Protected trees that the Tree Preservation Ordinance directs citywide, the River Plan further notes the importance of protecting fragile habitat isolated in the RODZ, and names oaks specifically, whenever feasible. Thus, while the RODZ policy is not to mandate preservation of all the oaks on APN -009, the proposed removal of 8 oaks (36, 37, 59, 60, 61, 62, 101 and 202) is in conflict with RODZ direction.

Oaks 36 and 59, 60, 61 and 62 were each found to be in good to excellent condition and each is a mature 21 to 37 inches in diameter oak. Oak 37, which has been burned, exists in only fair condition. Oaks 101 and 202 are young (not even appearing on the 2003/2004 project arborist report); however, their location within the dripline of to-be-preserved oak 38 and near the to-be-preserved landscaped turn-around respectively, may increase the feasibility of their preservation.

PUD Restrictions

The 1982 approval of the existing Oak Creek Apartment project included a condition of approval requiring that the existing oaks on APN -009 be preserved. The Project proposes removal of 14 mature oak trees from within the APN -009 boundaries, and removal of most of these trees would be in conflict with the restrictions of these earlier conditions of approval that still remain in force. Removal of the two oaks (66 and 80) to accommodate the river terrace as directed by the General Plan policy (particularly in that the river terrace was designed to preserve most of the trees within the terrace) is not subject to the PUD restriction. Additionally, oaks #101 and 202 were not existing trees at the time the PUD condition was approved in 1982.[20] Removal of the other 10 mature oaks (#36-37, 59-62, 69, 75, 77, and 79) in order to accommodate residential development on APN -009 is in direct conflict with the existing PUD restriction requiring preservation of oaks. Although, the Project proposes to amend the PUD, removal of these oaks would be inconsistent with the existing PUD restriction.

Mitigation Measures

The following mitigation measures are recommended for the Project, consistent with the City of Petaluma's River Access and Enhancement Plan and Implementing Zoning Ordinance regulations as found in Chapter 17: Tree Preservation.

Mitigation Measure Bio-11A: Further Preservation of Existing Trees. To achieve greater consistency with the City's River Plan, the Residential portion of the Project should be redesigned to reflect the goal of preserving protected trees, particularly those protected trees located within the Petaluma River Plan Corridor (being that oak woodland habitat along the river which the River Plan calls to be protected particularly), and those oaks isolated in the RODZ, to the greatest extent possible. While it is recognized that the preservation of all existing trees on the Project

[20] Oaks 101 & 202 on APN -009 were less than 4 inches in diameter during the first arborist report of the site in 2003/2004; so likely these two oaks on APN -009 were not existing when the PUD condition was approved in 1982, and are not covered by that Condition.

site may conflict with reasonable land development considerations and with creation of the terrace directed by the General Plan, the design of the Project shall seek to preserve the most desirable and significant healthy trees on site.

a) No protected tree shall be removed unless a tree removal, grading or building permit is issued by the Community Development Department.

b) The residential structures and their associated improvements shall be shifted so as to not extend into the Petaluma River Plan Corridor. Protected healthy oak trees located within the Petaluma River Corridor (trees #69, 75, 77 and 79) shall be preserved by a reasonable redesign of the residential Project. Within the Petaluma River Plan Corridor, the small California bay (#74) shall also be preserved as a native within the Corridor, while eucalyptus (#76) shall be removed as an exotic species undesirable near a riparian setting.

c) As River Plan policy 20 (page 80) specifically directs the protection, restoration, and enhancement of fragile habitat isolated in the RODZ, such as oaks, whenever feasible and as Condition 5 of the Oak Creek Apartments PUD states all existing on-site oak trees shall be permanently preserved, preservation of the most healthy and mature oak trees on APN-009 shall be pursued during Site Plan and Architectural Review. These are oaks #36 and 59 – 62, all 5 of which were found to be in good to excellent condition and each of which is a mature oak ranging from 21 to 37 inches in diameter. Other trees shall also be considered for preservation but may not warrant the same level of priority, being either burned and in only fair condition (oak #37) or young as compared to oaks #36 and 59-62, and thus replaceable within a shorter period of time than the mature oaks (oaks #101 and 202, being within the dripline of to-be-preserved oak #38 and near the to-be-preserved landscaped turn-around, respectively).

d) The Site Plan and Architectural Review process shall further consider site design modifications to preserve Protected trees to the greatest extent possible at APN-006 generally (as directed by the Tree Ordinance). Each Protected tree shall be further considered for preservation; oaks #1, 13, 17, and 100 shall be particularly pursued.

e) During preparation of the site plan for Site Plan and Architectural Review, the applicant shall work collaboratively with the arborist and the civil engineer to design a site plan that addresses Bio 11 b through d. The arborist shall provide the further tree preservation analysis, as part of the SPAR submittal.

Mitigation Measure Bio-11B: Protected Tree Replacements. For all protected trees permitted by the City to be removed, the project applicant shall provide replacement trees at the following ratios:

a) All protected trees determined by the Project arborist to be in good or excellent health, and/or with moderate to good structure, shall be replaced on a one-to-one trunk diameter basis. (Example: A 24-inch protected tree in good or excellent condition must be replaced with new trees totaling 24 inches in trunk diameters.)

b) All protected trees determined by the Project arborist to have fair or marginal health, and/or with marginal structure, shall be replaced on a two-to-one trunk diameter basis. (Example: A 24-inch protected tree in fair-to-marginal condition must be replaced with new trees totaling 12 inches in trunk diameter

c) Replacement tree ratios shall be applied as follows:

- 24-inch box replacement tree = 2-inch replacement trunk diameter

- 36-inch box replacement tree = 3-inch trunk replacement diameter
- 48-inch box replacement tree = 4-inch trunk replacement diameter

d) Replacement trees shall be at minimum 24-inch box size.

e) All protected trees determined by the Project arborist to have poor health or poor structure are not required to be replaced.

f) Replacement trees shall be planted within the Project boundaries to the extent feasible, and the applicant shall find suitable off-site location(s) for the required trees if on-site replacement is found infeasible.

g) If the location of replacement tree planting will remain as a natural area suitable for the healthy and long-term growth of native trees, replacement of protected trees should occur in-kind. If the location of replacement tree planting will be part of an irrigated, ornamental landscape area, replacement of protected trees may occur with a species as identified by the project arborist and approved by the City Planning Department.

Mitigation Measure Bio-11C: Tree Protection Plan. All trees designated for preservation must have a good chance of long-term survival; specific recommendations to avoid firstly construction and then long-term impacts shall be included for each to-be-preserved tree. Simply preserving a tree does not excuse it from designated mitigation requirements. Preserved trees must have a good chance to survive after all the impacts of construction are considered. Consistent with the recommendations for tree protection as listed in the Petaluma River Access and Enhancement Plan (RAEP),[21] a tree protection plan for the Project shall be prepared by a licensed landscape architect, arborist or certified forester and approved by the City, for all trees proposed to be preserved within the Project to protect them during on-site grading and construction. The River Plan includes the following tree protection measures:

a) All trees over five feet tall, or with a diameter over six inches measured at 4.5 feet in height over ground level, must be drawn to scale on plans, including species, approximate age and height, diameter at three feet and drip line. Also, show trees on adjacent property if the property line abuts or goes under drip line. Oaks to 4" in diameter, within 50' of the property line should be called out separately.

b) Plans shall indicate clearing, stripping and grading limits. Clearing and stripping limits must be staked on-site by the project engineer.

c) All utility plans must be included and their location relative to trees shown on plans.

d) Specific trees to be saved must be noted on the grading plans and shall be clearly marked on all plans and in the field.

e) Trees within the clearing areas (including exotics) noted to be removed shall be clearly marked on plans and in the field.

f) Applicants are encouraged to work closely with City staff to decide which trees, if any, must be removed. Convincing and compelling reasons must be provided for the removal of any

[21] City of Petaluma, *Petaluma River Access and Enhancement Plan*, Section 7.3: Tree Protection Plan for Development Around Native Oaks and Native Riparian Species, page 206

native species.

g) Bulkheads or tree wells may be used around trees where grading may be detrimental to the tree's preservation.

h) No grading shall be done within the drip line of trees to be saved except where noted on approved grading or landscaping plan.

i) Construction equipment is prohibited from areas of the site where no grading will occur. Storage of equipment, vehicles, topsoil or materials shall not be permitted within the drip line of trees to be saved. Areas of natural vegetation shall be protected as necessary.

j) Trees to be saved shall be fenced or protected to the satisfaction of the Planning Director prior to start of construction, and maintained throughout the construction period.

k) If grading is permitted under a drip line, once grade has been established, a temporary six-foot tall chain link fence should be installed around the tree at a distance of six feet minimum (or at a distance to be determined by arborist), from the trunk. This fence is to remain until construction is complete. Nothing may be stored inside this fence.

l) All excavation within a tree's drip line should be done by hand with a shovel and pick. If a woody root is encountered, care should be taken not to split the root, as this would create an entrance site for disease that can destroy the root and grow into the tree via the root. The roots should be wrapped in wet burlap to protect them from drying out while they are out of the soil. If a root needs to be cut, a very sharp hand-pruning saw should be used. Again, be careful not to split or twist the root or allow it to dry out.

m) If a utility line must be installed within a drip line, drill or bore the conduit through the soil rather than digging a trench. Less root damage will occur. Place all utility lines in the same passage, if possible, to avoid disruptions to the root zone.

n) There should be no trenching, drilling, or boring within six feet of the trunk. In parking lots, irrigation and airification devices must be installed.

o) If paving is necessary within the drip line, use porous materials such as gravel, cobbles, brick with sand joints, wood chips or bark mulch.

p) Non-oak trees should be irrigated before construction starts. Oak trees should be irrigated prior to August 1. This will ensure that the trees can better withstand the stress of construction. Irrigation is extremely important during spring and summer for stressed, mature non-oak native species.

q) After construction, do not fertilize the native oak trees until the following season's leaf is matured. This prevents a construction stressed tree from further decline by over-expending its energy reserves in response to the fertilizer.

r) During the course of construction operations, any pruning of trees designated on plans as to be saved, shall be performed under the supervision of a qualified arborist. No pruning by construction personnel is permitted. Care shall be taken to ensure that proper pruning, thinning and treatment for disease prevention shall be employed.

s) Any additional tree removals necessitated during the course of construction operations, but not shown for removal on approved plans, shall be inspected and approved by the Planning Department prior to such removals. Planting of specimen trees (36-inch box) at a compensation rate of at least 3:1, or as determined by the City will likely be required to

replace trees damaged or removed during construction.

t) On-site inspections by the project engineer and landscape architect shall ensure that there is no encroachment into the areas beyond the "limits of grading" as shown. Trees outside the grading area, or designated to be saved, are to be adequately protected during construction operations.

u) Landscaping under native oak trees should consist of drought tolerant plants or California native plants that are drought tolerant in nature and must not require supplemental water so as to be detrimental to the trees. There is to be no landscaping within the drip line. Chipped bark, mulch, or cobblestones are suitable for this area. No lawns should be planted within the drip line.

v) Permanent irrigation systems should be bubbler, drip, or sub-terrain only. No sprinkler systems should be allowed within six feet of trees, except for Oaks. Oaks may have a temporary drip only.

w) A manually operated drip system is the preferable method of irrigation within the drip line, although irrigation is not recommended under established native oaks at all, and especially not in the summer. Never allow irrigation water to seep into the six-foot radius or pool around the root crown.

Resulting Level of Significance

With implementation of Mitigation Measures Bio-11A through -11C, the Project would comply with City of Petaluma plans, policies and ordinances regarding protected trees, and the impact would be reduced to a level of less than significant.

However, removal of any mature oak trees from the portion of the Project site within APN -009 for the residential component (even if replaced) would be inconsistent with the prior condition of approval for the Oak Creek Apartment project PUD; though the Project includes a proposal to amend this restriction.

Spreading Sudden Oak Death

Bio-12: Removal of *Phytophora ramorum* host plant materials during tree removal could result in the spread of Sudden Oak Death to the Petaluma River riparian habitat. (**Less than Significant with Mitigation Measures**)

Since 1995, native oaks have been dying in Sonoma County due to the disease known as sudden oak death, caused by the pathogen *Phytopthora ramorum,* a fungus associated with wet or moist climates, cool temperatures, and living plants. Its spores occur in soil and water as well as plant material. The risk of movement and spread of the organism is greatest in muddy areas and during rainy weather. In addition to coast live oak and bay laurel, the sudden oak death pathogen affects California black oak, tanbark oak rhododendron, madrone, California huckleberry, California buckeye, big-leaf maple, toyon, and Manzanita and coast redwood.

Mitigation Measures

All coastal counties where there are confirmed cases of sudden oak death are required to follow State and federal regulations when handling or transporting host materials. The following mitigation measures are required, consistent with these regulations addressing the handling and transport of horticultural plant stocks within and between counties.

Mitigation Measure Bio-12A: Infected Tree Identification. Pursuant to the City's tree removal permit process, all trees of "at-risk" species that are proposed to be removed shall be surveyed for sudden oak death pathogens, and individual treatment methods identified.

Mitigation Measure Bio-12B: Tree Removal Precautions. If a tree needs to be removed, the tree stump should be cut as close to the ground as practical. Stump grinding is not recommended because the equipment may become contaminated by soil and result in pathogen spread when used at another location. The operation of vehicles or heavy equipment in such areas may lead to further disease spread when soil is disturbed and moved around. If at all practical, tree removal should be scheduled between June to October when conditions are warm and dry, and avoid removing diseased trees when moist conditions favor pathogen spread (November to May).

Mitigation Measure Bio-12C: Debris Removal Precautions. Proper disposal of infested material is an effective means of limiting the spread of pathogens. In infested areas, leaving infected or dead trees on site has not been shown to increase the risk of infection to adjacent trees. Removal from a property is only recommended if it is the first infected tree to be detected in the area, or the fire risk is high, or if the dead tree is a safety hazard. If debris cannot be left on site, infested material should be disposed of at an approved and permitted dump facility.

a) Whenever possible, the tree debris should be left on-site in a safe area where large woody debris will not move, endanger the public, contaminate uninfected hosts, or constitute a fire hazard.

b) When infected oaks are cut down and left on site, branches should be chipped, and larger wood pieces cut and split. Woodpiles should be stacked in sunny locations to promote rapid drying.

c) Firewood and chips should not be left in an area where they might be transported to another location (e.g. trailside, parking areas, etc.).

Resulting Level of Significance

Implementation of the above mitigation measures would reduce the environmental impacts associated the possible spread of sudden oak death to a level of less than significant.

Cumulative Biological Impacts

Bio-13: The Project would contribute to the cumulative alteration of biological habitats throughout the City, and contribute to fragmentation and loss of regional biodiversity through the incremental conversion of plant and wildlife habitat (including special status species habitats) to residential use. (**Less than Significant with Mitigation**)

The area considered for cumulative biological resource impacts is the City of Petaluma and Sonoma County. The Project is generally consistent with the Natural Environment Element of the City of Petaluma General Plan 2025 and the Petaluma River Access and Enhancement Plan. However, the Project does include elements that are inconsistent with the River Access and Enhancement Plan, as described in the discussion of Consistency with the Petaluma River Plan Corridor.

The Project's proposed development plan for new apartments encroaches into the Petaluma River Preservation Zone; the residential component of the Project also encroaches into the Buffer at the upstream half of the Project; and the removal of 5 trees from the Preservation Zone to accommodate

residential development is in direct conflict with River Plan policies intended to protect biological resources.

Development envisioned under the General Plan (including the Project) would incrementally alter biological habitats in the City and contribute to a fragmentation and loss of regional biodiversity through the incremental conversion of plant and wildlife habitat (including special status species habitats) to human use, and thus limit the availability and accessibility of remaining natural habitat. The General Plan 2025 EIR found that cumulative biological impacts would be significant. However, incremental project-specific impacts to oak and riparian woodlands, and wetlands were found capable of being mitigated to less than significant. The Project is included in the City's General Plan and considered as part of the City's planned buildout in the General Plan EIR. Alteration of biological habitats was identified as cumulatively considerable in the General Plan EIR, and the Project, even though its specific impacts would be less than significant, would still contribute to this significant cumulative impact.

7

Cultural and Tribal Cultural Resources

The following chapter of this EIR provides an analysis of potential impacts to cultural and historic resources resulting from implementation of the Project. The information presented in this chapter of the EIR has been derived from the following primary sources:

- Archaeological Resource Service (ARS), *A Cultural Resources Evaluation of the Oak Creek Development Phase II* (including a field survey on November 18, 2003), December 1, 2003 (**Appendix 7A**)
- William Self Associates (WSA), *Cultural Resources Assessment, Sid Commons Apartment Project*, including a field survey on November 17, 2007), November 2007 (**Appendix 7B**)

There have also been several previous cultural resource evaluations conducted within the vicinity of the Project site, including two separate studies previously examining portions of the current Project area. These additional studies are referenced, below.

Physical Setting

Paleontological Setting

Ethnographic Setting

At the time of initial contact between European explorers and the Native Californian, a people who were of the Penutian linguistic stock and who are now referred to as Coast Miwok inhabited the region that is inclusive of the Project site.[1]

The diverse landscape of this area allowed the Coast Miwok to practice subsistence based on hunting, fishing, and gathering. Salmon, steelhead, and geese were available in the late winter. Fish and kelp were collected from tidal pools in the spring. Mussels and clams were also harvested. Tule and log rafts propelled by double-bladed paddles (similar to those that were used in the Santa Barbara Channel Island region) were used to navigate bays and lagoons. Coast Miwok villages were located near shores, lagoons, and sloughs. Miwok dwellings were constructed above ground and were made from wood poles tied together at the top to form a conical structure that was then covered with grass, rushes, or tules. Larger villages had sweathouses that were dug into the ground.

Clamshell beads made using a pump drill were used as currency. The Coast Miwok appear to have had a monopoly on the local clam beds. Shell currency was traded north for magnesite cylinders, venison, and obsidian from the Pomo, and yellow paint and obsidian from the Wappo. Ethnographic borders appear to have been relatively fluid for the collection of some raw materials, including medicinal plants, and items for basketry, which was a well-developed skill in the Coast Miwok community.

[1] Kelly, I., Coast Miwok; in Handbook of North American Indians, 1978

The arrival of the Spanish in the San Francisco Bay Area in 1775 led to the rapid demise of native California populations. Diseases, declining birth rates, and the effects of the mission system coupled with the Russian founding of Fort Ross in 1812 served to eradicate the aboriginal life ways. With Mexican independence in the 1820s, numerous ranchos were established. Generally, the Native Californians who remained were then forced by necessity to work first on the ranchos and later in the mills and farms that sprang up in Sonoma County.

Historic Setting

Exploration along coastal California was undertaken as early as 1602, when the vessels of the Vizcaíno expedition traveled as far north as Cape Mendocino. Nearly two hundred years later, Juan Francisco de la Bodega y Cuadra explored the California coast, as Spain became interested in the region as a place of potential colonization. Bodega mapped and named the bay that still bears his name. [2] While the Spanish built their system of missions, military posts, and pueblos along the coast, Ivan A. Kuskov, an agent of the Russian-American fur company established a settlement at Fort Ross (1812). Although the population of Fort Ross never exceeded 400 people, its successful fur harvests and attempts at agricultural development spurred the Spanish to extend their reach north of San Francisco Bay.

The two northernmost missions, San Rafael Arcángel and San Francisco de Solano, were founded in 1817 and 1823, respectively. Mission San Rafael Arcángel was first founded as an asistencia hospital, and gained full mission status on October 19, 1822. The last two of the California missions to be established, they represent the only growth of the mission system after Mexico's independence from Spain. Ultimately, Mexican rule led to the secularization of the mission system, as well as the division of much of northern California into large ranchos. Deteriorating relations between the United States and Mexico resulted in the Mexican War, which ended with Mexico's relinquishing California to the United States under the Treaty of Guadalupe Hidalgo in 1848.

With the onset of the Gold Rush soon after the signing of the treaty, rapid changes in population and land use were in store for the region. Land use changes resulted as livestock grazed some native grasses to extinction; as woodlands were cut for lumber, railroad ties, and mine timbers; and as agricultural development occurred on nearly all the arable land. The scrutiny of Spanish and Mexican land grants began after the time of statehood (1850), when increased settlement resulted in the subdivision of large tracts of land and a shift in agricultural production away from the hide and tallow trade and toward the production of grain, fruits, and vegetables. The location of the City of Petaluma was largely determined by activity along the river. Following the gold rush, supply posts and hunter's camps sprang up along the river's banks, and the river itself supported early commerce.[3]

Petaluma was incorporated in 1858, making it the oldest city between San Francisco and Eureka. Charles Minturn, who ran a successful ferryboat company known as the Contra Costa Steam Navigation Company, chartered a three-mile rail line, the Petaluma and Haystack Railroad, in August of 1864. The depot was located downtown near the river, at the corner of First and B streets, and the single locomotive owned by the operation was built at the Atlas Foundry in San Francisco.

[2] Kyle, D. E., Historic Spots in California, 1990

[3] Ibid

Although the railroad remained operational until 1875, an explosion in 1866 at the corner of Second and B Streets in Petaluma led to the conversion of the rail line from steam to mule power. [4]

The local Petaluma and Haystack Railroad was soon joined by the more extensive San Francisco and North Pacific Railroad, which made much-needed connections between the hub of San Francisco and points north, including Petaluma.

> *"This line which traverses the entire length of the Petaluma, Santa Rosa, and Russian River valleys, was commenced in the year 1869, and was completed to its present terminus at Cloverdale in 1872. As a road, not one in the entire State is more complete in its appointments, while from its incipience to the present time it has progressed with the county, and reflects much credit upon its builders and upon its management."* [5]

The San Francisco & North Pacific railroad was built by Peter Donahue, a very successful San Francisco industrialist who, along with his brothers, played a major role in founding San Francisco's Union Iron Works as well as the city's first coal gas works.

Petaluma became well known for its poultry farms, which came to dominate local agriculture. This was due in large part to the invention of the first successful egg incubator in 1879 by Lyman Byce, which made the industry more profitable. Hundreds of chicken farms began to spring up all over the countryside, and at 30 cents per dozen, profits from egg businesses began to pour into the city. By the turn of the 20th Century, Petaluma became known as the "Egg Basket of the World." [6]

The epicenter of the 1906 San Francisco Earthquake was located only 18 miles from Petaluma. Compared to towns located farther from the epicenter, the city survived with relatively little damage. As a result, numerous 19th century structures remain standing in Petaluma today.

Results of Records Search

Staff at the California Historical Resources Information System (CHRIS), Northwest Information Center at Sonoma State University conducted a record search of the Project vicinity on October 25, 2007.[7] Information on previous archaeological surveys and recorded sites within a ¼-mile radius of the Project area was gathered to identify and evaluate the potential for the presence of cultural resources at the Project site. The study included a review of archaeological, ethnographic, historical, and environmental literature as well as records and maps on file at the California Archaeological Inventory. These included the Office of Historic Preservation's Directory of Properties in the Historic Property Data File for Sonoma County, Bower's Map of Sonoma County (1867), GLO Plat Map, T5N, R7W (1864), Rancho Petaluma Plat Map (1860), Rancho Roblar de la Miseria Plat Map (1857), Thompson & Co.'s Historical Atlas Map of Sonoma County (1877), Reynolds and Proctor's Illustrated Atlas of Sonoma County (1898), USGS Santa Rosa Quadrangle (1916), and the USGS Petaluma Topographic Quadrangle (1914).

Reviewing the findings of the previously conducted reports and the historic maps, it is evident that two separate clusters of building are associated with the Project site.

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4 Kneiss, Gilbert H., *Redwood Railways*, 1956

5 Munro-Fraser, J.P., *History of Sonoma County*, 1880

6 Kneiss, 1956

7 Sonoma State University, Northwest Information Center, File No. 07-0628, October 25, 2007

- One farming complex was located in the northern portion of the Project area. A house existed there in 1916, (as seen on the 1916 Santa Rosa 15' quadrangle). By 1954, the farming complex contained four barn-like structures, but no house. Between 1954 and 1973, several outbuildings were added.
- A second farming complex was located on the southern tip of the Project site, largely on land south of the Project site; it consisted of a house and several barns. By 1954, the only remaining structure was one barn on the southern tip of the Project site.
- By 1998, no structures remained at the Project site, with the partial exception of the barn at the southern tip of the Project site, which was described as a fallen down shed (JSA 1998). No structures now exist on the Project site.

The records search indicated that there are no previously recorded archaeological sites within the current Project area, though there have been a total of twenty-five studies yielding five recorded sites within a ¼-mile radius of the site. Five of the previous studies included all or portions of the Project site. The results of the most relevant previous investigations are summarized below:

Oak Creek Apartments, 1980

In 1980, Steven Kuhn performed an evaluation of the proposed Oak Creek Apartment complex site, consisting of 12.5 acres immediately adjacent to the current Project site. No cultural resources were observed during the preliminary field evaluation, and the Oak Creek Apartments were constructed without encountering archaeological materials.

Rainier Avenue Extension, 1991

Thomas Origer surveyed the route of a proposed extension of Rainier Avenue in 1991. This linear survey passed through the center portion of the Project site. He noted that the remains of several recent structures and scattered debris were observed along the route, but "no prehistoric archaeological remains, historic artifacts, or significant architectural resources were found within the project area." [8]

Anderson Ranch, 1997

An evaluation of the Anderson Ranch on Cinnabar Hill (located west of the Project site, on the westerly side of the railroad tracks, at 195 and 196 Cinnabar Road) was performed for the City of Petaluma by Katherine Johnson (Johnson 1997). It did not find the structures of the Anderson Ranch eligible for the National Register of Historic Places, but did find it to merit special attention at the local level. [9]

Corona Reach, 1998

In 1998, Jones and Stokes Associates (JSA) evaluated the Corona Reach project, consisting of 361 acres of land along the River in northern Petaluma. This included portions of the current Project site. Three hundred and seven acres were systematically surveyed for cultural resources, and three historic sites, one prehistoric site, and thirty-two potentially historic standing structures were identified. One of the historic sites was located near the southern portion of the Project area. This

[8] Origer, Thomas, An Archaeological Survey for the Rainier Avenue Extension, Petaluma, Sonoma County, California, Unpublished report on file at the CHRIS under S-12858, 1991

[9] Johnson, Katherine. Site record for the Anderson Ranch, on file at the CHRIS, 1997

site consisted of the collapsed wooden outbuilding at the southern tip of the Project site, designated as Corona-JSA-1. Other sites identified nearby included the remains of older residential structures and a collapsed bridge, concrete footings and a foundation with building debris, and a prehistoric scatter of shell, flaked stone and stone tools with some historic debris. Other potentially significant standing structures were not recorded as part of the JSA evaluation, but they were noted as being located on Petaluma Boulevard, Shasta Avenue and Cinnabar Avenue. Three of the buildings determined to be potentially of historic value are located adjacent to the Project site, on the west side of the railroad tracks, on the existing Shasta Avenue. These buildings include a square shack with railroad ties as a foundation, a warehouse with a false front, and a small barn clad with corrugated metal sheets.[10]

Cloverdale to Larkspur, 1999

The route of the Northwestern Pacific Railroad tracks from Cloverdale to Larkspur was evaluated through a literature search performed by Michael Newland in 1999. Previously recorded archaeological sites and historic structures within 1,000 feet of the NWPRR tracks were identified. In the general area of the Project, two archaeological sites were noted. These are P-49-001979, a historic farm complex across Highway 101 to the north, and P-49-002536, an archaeological site with prehistoric and historic components, to the northwest of the Project site (previously recorded by JSA in 1998).[11]

Petaluma Trolley, 2003

Archaeological Resource Service performed an evaluation of the proposed route of the Petaluma Trolley, which included the western edge of the Project site. No significant historic resources were encountered in the immediate vicinity, however it was noted that historic structures were present on the hill to the northwest (Anderson Ranch previously evaluated by Katherine Johnson in 1997 – see above).[12]

Rainier Cross-Town Connector, 2012

The route of the Rainier Cross-Town Connector was evaluated by JRP Historical Consulting, LLC in 2012. This evaluation included land abutting the Project site at its northern extent for a short distance. The evaluation noted no resources at the Project site, however noted that the Anderson Ranch property, across the rail track and uphill from the Project site, meets criteria for listing on the CRHR and NRHP. The evaluation also noted two previously recorded archaeological sites; neither is on the Project site.

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10 Jones and Stokes Associates, "Archaeological Survey Report for the Corona Reach Project, City of Petaluma, Sonoma County, California". Report on file at CHRIS under S-20029, 1998

11 Newland, Michael, Cultural Resources Record Search and Literature Review for Stations, Sidings, and Bridges on the Northwestern Pacific Railroad, between Cloverdale and Larkspur, Sonoma and Marin Counties. On file at the CHRIS as S-22086; 1999

12 Chattan, Cassandra, An Evaluation of Cultural Resources Along the Proposed Petaluma Trolley Master Plan Project, Petaluma, Sonoma County; ARS 01-048. On file at the CHRIS, 2003

Field Survey Results

2003 ARS Field Survey

On November 18, 2003, Archaeological Resource Service (ARS) conducted a surface survey of the Project area. No structures were present. The perimeter was surveyed and transects in approximately 10 foot intervals were made through each of the portions of the Project site. Trowels were used to scrape the surface of the ground, particularly in areas where grasses obscured visibility. One pestle, one fragment of abalone shell, a cement lined well and a stone lined well were observed during the survey. Scattered remains of removed structures were present throughout the Project area, including concrete retaining walls, concrete slabs and portions of asphalt.

While debris from several older structures was observed in recently consolidated piles, none of these boards or pieces of concrete was of historic significance or appeared to have the potential to yield further information about the past. The original locations of these destroyed structures could not be determined. A few fragments of ceramics, a piece of glass and a piece of abalone were observed but these did not appear to be of significant age or in a concentration. Two wells are located on the property. While neither appeared to be of architectural historic significance, the ARS evaluation notes that they do have the potential to contain historic debris since people often used old and abandoned wells to deposit trash. While the wells may yield information about the past, such information is not known at this time.

While one prehistoric pestle was encountered on the property, no further prehistoric site indicators were observed. The soil on the property had been heavily disturbed by the removal of structures and foundations, and soil visibility was very good. The evaluation noted that such high soil visibility would have made the finding of a prehistoric site or historic trash deposit on the property quite likely, were there an unburied one on site.

2007 WSA Field Survey

WSA Project Director, Eric Strother M.A., RPA, made a site visit on November 17, 2007. Since the site area had been subject to examination by ARS in 2003, the entire parcel was not re-surveyed. No standing structures were observed on the parcel.

The abandoned rock-lined well and the concrete well previously identified by ARS in 2003 were found during the 2007 site visit. Both wells appeared to be in similar condition to what was originally observed in 2003. A very sparse scatter of historic ceramic and glass fragments was observed on the ground surface near both wells. The oldest items, consisting of flat glass and white ceramics, appeared to date to the mid-1900s. It is possible that these materials originated from the wells, and there is the possibility that within the wells, additional historic artifacts that were not observed during the 2007 study may be present. No other historic or prehistoric cultural materials were observed within the Project area during the site visit, and no significant historic cultural resources were observed during the 2007 study.

Native American Consultation

As the project originally included an amendment to the City of Petaluma's General Plan,[13]Government Code §65352.3 was triggered; which requires local governments to consult with

[13] As the originally proposed 312 unit project exceeded the density range of the applicable General Plan land use designation.

California Native American tribes identified by the Native American Heritage Commission (NAHC) for the purpose of protecting, and/or mitigating impacts to cultural places. In accordance with statutory requirements stipulated in Senate Bill 18 (SB 18):

> *Prior to the adoption or any amendment of a general or specific plan, a local government must notify the appropriate tribes (on the contact list maintained by the NAHC) of the opportunity to conduct consultations for the purposes of preserving, or mitigating, impacts to, cultural places located on land within the local government's jurisdiction that is affected by the proposed plan adoption or amendment. . . . (Supplement to General Plan Guidelines-2005).*

To facilitate this government-to-government consultation, and on behalf of the City of Petaluma, Dr. James Allan of WSA submitted a Tribal Consultation List Request form to the NAHC on October 30, 2007 to describe the proposed project and to request the name(s) of tribal representatives who would be interested in conducting consultation with the City of Petaluma. In response, NAHC staff member Ms. Katy Sanchez provided the contact information for Mr. Greg Sarris, Chairperson of the Federated Indians of Graton Rancheria in a letter dated November 8, 2007. On November 30, 2007, on behalf of the City, WSA contacted Mr. Sarris by letter with an invitation to consult with the City on the Project, pursuant to Government Code §65352.3(a)(2).

In addition, on October 30, 2007, Dr. Allan contacted the NAHC by letter to request information on known Native American traditional or cultural properties within the Project area, and to request a listing of individuals or groups with cultural affiliation to the Project area. Included in the NAHC response was a list of interested Native American contacts (see **Appendix 7B**). The names and contact information for five Native Americans were included on the contact list. Three of the individuals on the list are affiliated with the Federated Indians of Graton Rancheria, and two are representatives of other tribal groups. As the Chairperson of the Federated Indians of Graton Rancheria was already invited to consult with the City of Petaluma on a government-to-government basis, the three representatives from that tribe were not solicited individually. On November 15, 2007, WSA sent letters to the two listed Native American contacts who are not affiliated with the Federated Indians of Graton Rancheria. The letters described the Project and invited their comments regarding potential cultural resources or sacred lands within the Project area. Follow-up phone calls were placed on November 29, 2007 to each of the Native American contacts.

In response to these contacts with Native American representatives, Ms. Sanchez of the NAHC replied to the WSA letter on November 8, 2007, stating that, "a record search of the sacred land file has failed to indicate the presence of Native American cultural resources in the immediate project area." Of the other efforts to contact Native American representative (including Ya-Ka-Ama Porno, Coast Miwok, Wappo; Kathleen Smith Porno, Coast Miwok; and Greg Sarris of the Federated Indians of Graton Rancheria). WSA received either no comments, or a response that they were not aware of any sacred lands or cultural resources in the area.

Further invitation to consult occurred in 2016; see discussion at Native American Historic Resource Protection Act page 7-10.

Regulatory Setting

The following regulatory setting provides an overview of local, state and federal regulations that govern the identification, documentation and treatment of historic and cultural resources.

Federal Regulations

The following federal regulations provide a general context of the framework through which cultural resource identification, evaluation and protection is performed.

National Historic Preservation Act

The 1966 National Preservation Act (NHPA), as amended, provides the historic preservation framework for the United States. It outlines responsibilities for government agencies and establishes the environmental review process to encourage federal agencies to consider historic resources located within their jurisdiction. The NHPA establishes guidelines for the identification and evaluation of historic resources, and provides funding and support for private agencies.

The State Office of Historic Preservation (OHP) carries out review under Section 106 of the NHPA. Section 106 encourages consideration of the nation's historic resources during the planning and execution of federal projects and requires that a federal agency "take into account" how a project, which is defined as an activity or program funded in whole, or in part by the federal government, could affect historic properties. Therefore, prior to the issuance or authorization of any permit under Section 404 of the Clean Water Act, the U.S. Army Corps of Engineers, San Francisco District Regulatory Division, must consider the effect the permit may have on Historic Properties. Historic Properties may include prehistoric or historic districts, sites, buildings, structures, objects, sacred sites, and traditional cultural places, that are included in or eligible for inclusion in, the National Register of Historic Places.

National Register of Historic Places

The National Register of Historic Places (NRHP) is the nation's master inventory of known historic resources and includes listings of buildings, structures, sites, objects and districts that possess historic, architectural, engineering, archaeological or cultural significance at the national, state or local level. A historic resource can be a building, structure, object, site or district that is 50 years or older. As described in National Register Bulletin Number 15, *How to Apply the National Register Criteria for Evaluation*, a property must have both historical significance and integrity to be eligible for listing in the NRHP.

No resources on the Project site have been found to be potentially eligible for listing in the NRHP.

State of California

California Register of Historical Resources

The California Register of Historical Resources (CRHR) is the authoritative guide to the State's significant historical and archaeological resources. It serves to identify, evaluate, register and protect California's historical resources. The CRHR program encourages public recognition and protection of resources of architectural, historical, archaeological and cultural significance, identifies historical resources for state and local planning purposes, determines eligibility for historic preservation grant funding and affords certain protections under CEQA. All resources listed on or formally determined eligible for the NRHP are eligible for the CRHR. In addition, properties designated under municipal or county ordinances are also eligible for listing in the CRHR.

The California Register criteria are modeled on the National Register criteria. A historical resource must be significant at the local, state, or national level under one or more of the following criteria:

- It is associated with events or patterns of events that have made a significant contribution to the broad patterns of local or regional history, or the cultural heritage of California or the United States.
- It is associated with the lives of persons important to local, California, or national history.
- It embodies the distinctive characteristics of a type, period, region, or method of construction, or represents the work of a master, or possesses high artistic values.
- It has yielded, or has the potential to yield, information important to the prehistory or history of the local area, state or the nation.

No resources on the Project site have been found to be potentially eligible for listing in the CRHR, California Historical Landmarks, or California Points of Historical Interest.

California Environmental Quality Act (CEQA)

CEQA Guidelines Section 15064.5 defines a substantial adverse change in the significance of a historical resource as physical demolition, destruction, relocation, or alteration of the resource or its immediate surroundings such that the resource's significance would be materially impaired. Material impairment occurs when a project demolishes or alters in an adverse manner those physical characteristics of a historical resource that convey its historical significance and that justify its inclusion or eligibility for inclusion in the CRHR or a local register of historical resources. Generally, a project that satisfies the *Secretary of the Interior's Standards for the Treatment of Historic Properties with Guidelines for Preserving, Rehabilitating, Restoring, and Reconstructing Historic Buildings or Standards for Rehabilitation and Guidelines for Rehabilitating Historic Buildings* (Secretary of the Interior Standards, Weeks and Grimmer, 1995), is considered to have mitigated potential impacts on the historical resource to a level of less than significant.

CEQA Guidelines Section 15064.5(c) applies to the analysis of effects on archaeological sites. When a project would affect an archaeological site, a lead agency must determine whether the site is a historical resource, and therefore subject to the CRHR criteria listed above (particularly Criterion D4), or whether the site is a unique archaeological resource, as defined in CEQA section 21083.2, and whether the mitigation provisions of that section apply. If a lead agency determines that an archaeological site is neither historic nor unique, the resource requires no further consideration other than recordation of its existence if the lead agency so elects.

A resource "not listed in, or determined to be eligible for listing in, the California Register of Historical Resources, not included in a local register of historical resources, or not deemed significant pursuant to criteria set forth in subdivision (g) of Public Resources Code Section 5024.1 shall not preclude a lead agency from determining whether the resource may be a historical resource..." In other words, a lead agency must consider the potential for a resource to be historic, even in the absence of earlier historic designation or determination of eligibility. California Public Resources Code Section 5024 requires consultation with OHP when a project may affect historic resources located on State-owned land.

Native American Historic Resource Protection Act

The Native American Historic Resource Protection Act (Public Resources Code section 21083.09, added by Assembly Bill 52 or AB 52 [2014]) is intended to minimize conflict between Native American and development interests. AB 52 adds "tribal cultural resources" to the specific cultural resources protected under CEQA, and requires lead agencies to notify relevant tribes about development projects. It also mandates lead agencies to consult with tribes if requested, and sets

the principles for conducting and concluding the required consultation process. A tribal cultural resource is defined as a site, feature, place, cultural landscape, sacred place or object with cultural value to a California Native American tribe. AB 52 applies to all projects that have a notice of preparation or notice of negative declaration/mitigated negative declaration filed on or after July 1, 2015. If an agency formally decides to undertake a project after July 1, 2015, AB 52 requirements need to be incorporated.

On August 8, 2016, the Secretary for the California Natural Resources Agency certified and adopted amendments to the CEQA Guidelines including new regulations relative to tribal cultural resources. The following language was adopted for the revised CEQA Guidelines:

a) Would the project cause a substantial adverse change in the significance of a tribal cultural resource defined in Public Resources Code section 21074 as either a site, feature, place, cultural landscape that Is geographically defined in terms of the size and scope of the landscape, sacred place, or object with cultural value to a California Native American tribe, and that is:

   1) listed or eligible for listing in the California Register of Historical Resources, or in a local register of historical resources as defined in Public Resources Code section 5020.1(k), or

   2) a resource determined by the lead agency, in its discretion and supported by substantial evidence, to be significant pursuant to criteria set forth in subdivision (c) of Public Resources Code Section 5024.1. In applying the criteria set forth in subdivision (c) of Public Resource Code Section 5024.1, the lead agency shall consider the significance of the resource to a California Native American tribe.

Though the timing mechanics stated by AB 52 did not require notification, city staff chose to provide notice pursuant to Public Resources Code §2080.3.1(d) on April 26, 2016. Notice was provided to the Tribal Heritage Preservation Officer of the Federated Indians of Graton Rancheria, being the Tribe that had requested placement on the Agency's Notice List. The certified letter and project information was received by the Tribe on May 2, 2016. Upon receipt of this notice, the Tribe has 30 days to request consultation pursuant to Public Resources Code §21083.3.1, 21083.3.2, and 21083.3. The Tribe chose not to request consultation within this period (nor thereafter).

California Public Resources Code Section 5087.5

This section of the code states that no person shall knowingly and willfully excavate, injure, remove or otherwise disturb any archaeological, historical, or paleontological materials or sites located on public lands without the permission of the public agency having jurisdiction over said lands. The violation of this section results in a misdemeanor.

California Health and Safety Code Section 7050.5

This section of the code mandates that, in the event human remains are discovered in a location other than a dedicated cemetery, all disturbance or excavation must cease and the county coroner must be notified. If the human remains are found to be of Native American origin, the Native American Heritage Commission shall be notified and will then identify and contact the most likely descendent to inspect the site and recommend future treatment associated with the contents of the grave.

California Native American Graves Protection and Repatriation Act

Section 8010 of California Health and Safety Code ensures that human remains of California Native Americans are treated with dignity and respect. The law also establishes mechanisms to aid federally recognized and un-recognized Native American tribes.

Local Regulations

City of Petaluma General Plan

The Historic Preservation Element of the Petaluma General Plan 2025 sets forth goals and actions that encourage preservation and continued stewardship of the City's historic and cultural heritage. The overall goal of this Element is to ensure the preservation, protection, rehabilitation and restoration of historical and cultural resources by recognizing their inherent value in linking the City's present form to its past. Much of the policy direction provided in the Historic Preservation Element seeks to maintain the historic-era integrity of Petaluma's Historic Districts, including the Historic Commercial District (listed on the National Register of Historic Places), and the Oak Hill-Brewster and "A" Street Historic Districts. Policies and programs relevant to the Project site include:

> **3-P-1**: Protect historic and archaeological resources for the aesthetic, cultural, educational, environmental, economic, and scientific contribution they make to maintaining and enhancing Petaluma's character, identity and quality of life.
>
> a. Ensure the protection of known and unrecorded archaeological resources in the city by requiring a records review for any development proposed in areas that are considered archeologically sensitive for Native American and/or historic remains.
>
> b. In accordance with CEQA and the State Public Resources Code, require the preparation of a resource mitigation plan and monitoring program by a qualified archaeologist in the event that archaeological remains are discovered.

Petaluma Zoning Ordinance

Chapter 15 of the IZO outlines processes to reverse the trend of destruction and neglect of valuable historic and cultural resources by establishing powers and duties for a cultural preservation commission, outlining the process to designate a historic landmark, outlining the permit review process for alterations, new construction and demolition of designated historic resources and allowing for the City Council to adopt Design Guidelines.

Definitions

Historical Resource

For the purposes of this analysis, the term "historical resources" shall be consistent with the definition provided in CEQA Guidelines Section 15064.5:

- A resource listed in, or determined to be eligible by the State Historical Resources Commission, for listing in, the California Register of Historical Resources (Pub. Res. Code Section 5024.1, Title 14 CCR, Section 4850 et.seq.);
- A resource included in a local register of historical resources, as defined in Section 5020.1{k) of the Public Resources Code or identified as significant in an historical resource survey meeting the requirements of Section 5024.1{g) of the Public Resources Code, shall be presumed to be historically or culturally significant. Public agencies must treat any such resource as significant unless the preponderance of evidence demonstrates that it is not historically or culturally significant;

- Any object, building, structure, site, area, place, record, or manuscript which a lead agency determines to be historically significant or significant in the architectural, engineering, scientific, economic, agricultural, educational, social, political, military, or cultural annals of California, may be considered to be an historical resource, provided the lead agency's determination is supported by substantial evidence in light of the whole record. Generally, a resource shall be considered by the lead agency to be "historically significant" if the resource meets the criteria for listing in the California Register of Historical Resources (Public Resources Code Section 5024.1, Title 14 CCR, Section 4852).

Even if a resource does not meet these criteria, it does not preclude a Lead Agency from determining that the resource may be a historical resource as defined in Public Resources Code sections 5020.1(j) or 5024.1.

Impact Analysis

Standards of Significance

In accordance with the California Environmental Quality Act (CEQA), State CEQA Guidelines (including Appendix G), City of Petaluma plans, policies and/or guidelines, and agency and professional standards, the Project's impact would be considered significant if it would:

1. Cause a substantial adverse change in the significance of a historical resource as defined in §15064.5;
2. Cause a substantial adverse change in the significance of an archaeological resource pursuant to §15064.5;
3. Directly or indirectly destroy a unique paleontological resource or site or unique geologic feature; or
4. Disturb any human remains, including those interred outside of formal cemeteries.
5. Cause a substantial adverse change in the significance of a tribal cultural resource as defined in Public Resources Code section 21074 as either a site, feature, place or cultural landscape that is geographically defined in terms of the size and scope of the landscape, sacred place or object with cultural value to a California Native American tribe.

Historical Resources

Cultural-1: The Project would not cause a substantial adverse change in the significance of a known historical resource; however, there is a potential that unidentified resources may be present within the onsite wells, the removal of which could result in a potentially significant impact to historical resources unless mitigated. (**Less than Significant with Mitigation**)

The Project has limited potential to directly or indirectly impact the significance of a historical resource. As stated in the 2003 ARS Field Survey and subsequent 2007 WSA Field survey, no structures remain on the site and no significant historic resources were identified on the Project site. The surveys did indicate the presence of historic foundations and concrete retaining walls, but none of these was observed to be discrete historic deposits, and many of the demolished building materials had been consolidated into piles and have been since removed. Therefore, none of the buildings and structures that formerly occupied the site retains sufficient integrity to be considered significant.

Both field surveys identified the presence of two wells, one constructed out of stone rubble and concrete, and the other solely out of concrete. Neither of the identified wells was found to be historically significant, although it was determined that because wells were often used as receptacles for trash and other items they could hold potentially historic resources below grade. At this time, no debris or trash abandoned in the well could be identified as both of the wells are filled with soil. However, the two on-site wells may contain historic-era debris, which may hold the potential to yield information about California History.

As mentioned above, there are several off-site historical resources. Construction of the Project would not conflict with the historic value or compromise the historical integrity of any of these off-site historic resources, including those known historic resources on properties along the Corona Reach of the Petaluma River in northern Petaluma, or the Anderson Ranch site that is located west of the Project site, on the westerly side of the railroad tracks.

Mitigation Measures

While it is unlikely that either well would contain debris and/or historical artifacts in such a concentration as to be of significant historical value, there remains the possibility that any historical artifacts located in the well could yield valuable information. As such, Mitigation Measure Cultural-1 (below), requiring that an archeological monitor be present during well removal in order to identify and recover any potentially historic deposits, shall be implemented.

Mitigation Measure Cultural-1: Monitoring of Well Abandonment. At such time as the two existing wells on the site are removed, a qualified archaeologist shall be present to record and recover any potentially significant historic-era deposits that may be uncovered. If historic materials are observed, they shall be recorded on the appropriate DPR forms and such forms filed with the CHRIS and the Planning Division. In the event that the onsite wells are abandoned and capped in place, then monitoring would be unnecessary, as no disturbance to potential resources would occur.

Resulting Level of Significance

With implementation of Mitigation Measure Cultural-1, any significant historic-era artifacts that may be present within the on-site well will be retrieved and evaluated at the time of well removal and potential impacts to significant historical resources will be reduced to less than significant levels.

Archaeological Resources

Cultural-2: The Project has the potential to adversely impact the significance of undiscovered archeological resources. (**Less than Significant with Mitigation**)

The Cultural Resource Studies prepared in 2003 and 2007 identified the presence of a pestle, a fragment of abalone shell, two historic era wells, and fragments of ceramics and glass. However, of the resources found, it was concluded that none appeared to be of a significant age or in a concentration such that they would be considered historically or archeologically significant.

Although neither of the Cultural Resource Report efforts encountered any significant archeological resources at the time these field surveys were undertaken, this does not preclude the potential that the site may contain as-yet undiscovered archeological artifacts. The site, located along the banks of the Petaluma River and in an area known to have been occupied by the Coast Miwok, still exhibits a heightened potential for archeological resources to be present below grade.

Mitigation Measures

In order to ensure that undiscovered archeological resources are not adversely impacted by construction activities (including grading, excavation and other ground disturbing activities), the following Mitigation Measure Cultural-2 shall be implemented. Measure Cultural-2 requires the presence of a qualified archeologist during ground-disturbing activities in sensitive areas, such as proximate to the Petaluma River.

Mitigation Measure Cultural-2: Discovery of Unknown Archaeological Resources. To reduce potential impacts on prehistoric site deposits during construction,

a) The applicant shall retain the services of a qualified archaeological consultant approved by the City of Petaluma to monitor ground-disturbing activity near the Petaluma River; that is during the river terrace grading work. The archeologist shall monitor ground-disturbing activities according to a schedule agreed upon by the archeological consultant and the City of Petaluma. The monitor need only be present during activities that could impact significant archeological deposits. After considering the types of project activities and the probabilities of encountering a significant archaeological deposit, the City and the archaeologist shall adjust the monitoring frequency accordingly, or implement a cessation of the monitoring schedule altogether.

b) If a concentration of artifacts or cultural soils is encountered during construction anywhere on-site, all soil-disturbing activities within 100 feet of the deposit shall cease. The archaeological monitor shall have the authority to stop work and temporarily redirect crews and heavy equipment until the deposit is evaluated. The archaeological monitor shall immediately notify the City of Petaluma Planning Division of resources encountered. The archeological monitor shall, after making a reasonable effort to assess the identity, integrity, and significance of the encountered archaeological deposit, present the findings of this assessment to the City and provide treatment recommendations.

Resulting Level of Significance

With implementation of Mitigation Measure Cultural-2, any potential impacts to buried, as-yet undiscovered archeological resources would be reduced to less than significant levels.

Paleontological Resources

Cultural-3: The Project has the potential to adversely impact the significance of currently undiscovered paleontological resources. (**Less than Significant with Mitigation**)

The geology of the Project site is characterized by Holocene alluvium soil deposits underlain by bedrock. The bedrock consists of Wilson Grove Formation sandstone (Late Miocene) and Franciscan Complex (Jurassic to Cretaceous). Paleontological remains have been recovered from both of these geologic formations within Sonoma County in the past,[14] indicating that bedrock underlying the Project site has potential to contain significant paleontological resources. Furthermore, areas with alluvium soil deposits in close proximity to rivers have been known to contain vertebrate fossils. Due to the infrequency of fossil preservation, fossils (particularly vertebrate fossils) are considered non-

[14] Sonoma County General Plan 2020 EIR.

renewable resources, and destruction of these resources would be a significant environmental impact.

Mitigation Measures

Mitigation Measure Cultural-3 shall be implemented in order to ensure that ground-disturbing activities do not adversely impact any as-yet undiscovered paleontological resources.

Mitigation Measure Cultural-3: Discovery of Unknown Paleontological Resources. In the event paleontological resources are encountered, the applicant shall procure a qualified paleontologist approved by the City of Petaluma to document, evaluate, and assess the significance of the resource in accordance with the criteria set forth in the guidelines adopted by the Society of Vertebrate Paleontology, CEQA Guidelines Section 15064.5.

a) In the event of discovery during construction, excavations within 100 feet of the find shall be temporarily halted or diverted until the discovery is examined by a qualified paleontologist (per Society of Vertebrate Paleontology standards (SVP 1995). The paleontologist shall notify the appropriate agencies to determine procedures that would be followed before earthmoving or grading is allowed to resume at the location of the find.

b) If the City determines that avoidance is not feasible, the paleontologist shall prepare and recommend to the City an excavation plan for mitigating the effect of the project on the qualities that make the resource significant. The plan shall be submitted to the City for review and approval prior to resuming construction activities.

Resulting Level of Significance

Implementation of Mitigation Measure Cultural-3 will ensure that potential impacts due to the discovery of unknown paleontological resources are reduced to a level below significance.

Human Remains

Cultural-4: Ground-disturbing activities associated with site preparation, grading, and excavation could disturb human remains, including those interred outside of formal cemeteries, which would be considered a potentially significant impact. (**Less than Significant with Mitigation**)

The potential to uncover human remains, including Native American human remains, exists throughout California. Although not anticipated, human remains may be encountered during site-preparation and grading activities. The presence of buried human remains onsite would constitute a potentially significant impact and would require notification of the County coroner and a qualified archeologist.

Mitigation Measures

In the event that human remains are encountered onsite the Project applicant shall implement the following Mitigation Measure Cultural-4, consistent with the provisions of California Health and Safety Code section 7050.5(b) during all ground-disturbing activities:

Mitigation Measure Cultural-4: **Discovery of Human Remains**. In the event that human remains are uncovered during earthmoving activities, all construction excavation activities shall be

suspended and the following measures shall be undertaken in accordance with the Health and Safety Code Section 7050.5:

a) The Sonoma County Coroner shall be contacted to determine that no investigation of the cause of death is required.

b) If the coroner determines the remains to be Native American, the coroner shall contact the Native American Heritage Commission within 24 hours.

c) The project sponsor shall retain a City-approved qualified archaeologist to provide adequate inspection, recommendations and retrieval, if appropriate.

d) The Native American Heritage Commission shall identify the person or persons it believes to be the most likely descended from the deceased Native American, and shall contact such descendant in accordance with state law.

e) The project sponsor shall be responsible for ensuring that human remains and associated grave goods are reburied with appropriate dignity at a place and process suitable to the most likely descendent.

Resulting Level of Significance

With implementation of the Mitigation Measure Cultural-4, any disturbance of human remains would be handled in a manner that would avoid significant impacts, including impacts to Native American remains, and the impact would be less than significant.

Tribal Cultural Resources

Cultural-5: The Project site is not known to contain tribal cultural resource defined as a sacred place or an object with cultural value to a California Native American tribe. (**Less than Significant Impact**)

On behalf of the City of Petaluma and at the beginning of this EIR process, Dr. James Allan of WSA submitted a Tribal Consultation List Request form to the Native American Heritage Commission (NAHC) on October 30, 2007, with follow-up inquiry of tribal representatives as to their interest in consultation on the Project.

The City of Petaluma on April 26, 2016, after State passage of AB 52, chose to again invite that Tribe on the Agency's Notice List (the Federated Indians of Graton Rancheria) to consult on the project.

Responses to WSA's and the City's invitations to consult on tribal cultural resources either provided no comment, or indicated that they were unaware of any tribal or cultural resources in the immediate area. Based on these responses and the investigations conducted by WSA in 2007 and by ARS in 2003, the Project site is not known to contain tribal cultural resources, either as a sacred place or containing objects with cultural value to a California Native American tribe, and as Mitigation Measures Cultural-2 and -4 identify procedures should any unknown tribal cultural resources be disturbed, impacts of the Project on tribal resources would be less than significant.

8

Geology and Soils

The following chapter of this EIR provided an analysis of geology and soils impacts resulting from implementation of the Project. The information presented in this chapter of the EIR is derived from the following primary sources:

- United Soil Engineering, Inc., "*Geotechnical Investigation and Pavement Design for Proposed Residential Development 150 Graylawn Avenue,* October 21, 2003 (**Appendix 8A**);
- RGH Consultants, *Geotechnical Engineering Report Update for Sid Commons*, January 20, 2015 (**Appendix 8B**)
- RGH Consultants, *Supplemental Geotechnical Evaluation*, March 21, 2016 (**Appendix 8C**)
- CSW / Stuber-Stroh Engineering Group, Inc., *Preliminary Grading and Drainage Plan, Sheet C4*, August 6, 2015
- California Department of Mines and Geology, Fault Activity Map of California and Adjacent Areas, 1994;
- California Division of Mines and Geology, Probabilistic Seismic Hazards Assessment for the State of California, 1996 rev. 2002;
- California Division of Mines and Geology, Alquist-Priolo Earthquake Fault Zone Map for Glen Ellen Quadrangle, 2000;
- California Department of Transportation, California Seismic Hazard Map based on Maximum Credible Earthquakes, 1996;
- USDA Natural Resource Conservation Service, *Soil Survey for Sonoma County*, 2005;
- Working Group on California Earthquake Probabilities, United States Geological Survey Open-File Report 03-214, Earthquake Probabilities in the San Francisco Bay Region: 2002-2030;
- City of Petaluma, Petaluma General Plan 2025; and
- US Geologic Survey (USGS), Quaternary Geology and Liquefaction Susceptibility Map for Napa California (which includes the City of Petaluma), 1:100,000 Quadrangle, USGS Open-File Report 98-460.

Physical Setting

Regional Seismicity

The San Francisco Bay Area is located along the margin between two major tectonic plates, the Pacific and the North American. As such, it is a seismically active region. The United States Geological Survey (USGS) estimates that there is a 62 percent probability that an earthquake of Richter Magnitude $\geq$ 6.7 will occur on one of the faults in the Bay Area between the years 2001 to 2030. Of that, there is a 27

percent chance that a large earthquake will occur on the Hayward-Rogers Creek Fault, a 21 percent chance that one will occur on the San Andreas Fault, and an 11 percent chance that one will occur on the Calaveras Fault, although seismologists are unsure whether the Calaveras Fault is capable of producing large earthquakes, or if it fails predominantly by producing moderate earthquakes and by fault creep.[1] **Table 8-1** presents a list of historic Richter Magnitude >6.0 earthquakes, with associated damages, in the vicinity of the Project site.[2] This list is not exhaustive, but is only meant to indicate the likelihood of the site experiencing seismically induced ground shaking in the future.

Table 8-1: Historic Earthquakes in the Vicinity of the Project Site

Fault Name	Year	Magnitude	Description
San Andreas	1838	6.8 - 7.4 (Approx.)	This Earthquake ruptured a zone approximately 100 miles long from San Francisco to San Juan Bautista. There was little registered damage due to low population levels at the time, but an equivalent earthquake at current population levels could be devastating to the region.
Hayward	1868	7.0	With an Epicenter near Hayward, this earthquake was known as the "Great San Francisco Earthquake" until that title was expropriated in 1906. Strong ground shaking was pervasive throughout the San Francisco Bay area, and a Modified Mercalli Intensity of VIII was estimated in Petaluma. Thirty people were killed and an estimated $350,000 was lost to damages.
Blind Thrust along Great Valley-Coast Range border region	1892	6.6 and 6.4	Two Earthquakes on April 19 and April 21 struck in the Vacaville-Winters area. The earthquakes reportedly resulted in three deaths and approximately $225,000 in damage. An MMI value of VI was likely felt in Petaluma.
San Andreas	1906	7.8	Known as the "Great San Francisco Earthquake", it (along with the fire it started) destroyed much of San Francisco, and an MMI value of VIII was felt in Petaluma. An estimated 3,000 lives and $524 million in property were lost.
San Andreas	1989	6.9	This earthquake struck in the Santa Cruz Mountains at Loma Prieta. Fifty-seven deaths were reported and $6 billion in damages were attributed to the Loma Prieta Earthquake

Tectonics and Faulting

Movement along the boundary of the Pacific and North American Tectonic plates is accommodated by the San Andreas Fault system. This system includes not only the San Andreas Fault, responsible for the devastating 1906 San Francisco and 1989 Loma Prieta earthquakes, but numerous secondary faults,

[1] Working Group on California Earthquake Probabilities, Earthquake Probabilities in the San Francisco Bay Region: 2002-2030, United States Geological Survey Open-File Report 03-214. Obtained from http://pubs.usgs.gov/of/2003/of03-214/

[2] California Geological Survey, California Historical Earthquake Online Database, 2007, obtained from http://www.consrv.ca.gov/CGS/rghm/quakes/historical/index.htm

many of which have produced large earthquakes in the past and are expected to do so again in the future. Many of these faults are within close proximity to the Project site.[3]

A map showing the locations of major faults in the site vicinity is presented as **Figure 8-1**. Fault location relative to Project site, status, date of most recent motion and Maximum Credible Earthquake (MCE) are presented as **Table 8-2**. According to California Geological Survey criteria, faults showing evidence of rupture during the Holocene (past 11,000 years) are considered active. Faults showing evidence of movement within the last 1,600,000 years are considered conditionally active.

Table 8-2: Active And Conditionally Active Faults Within 50 Miles of the Project Site

Fault Name	Distance from Project mi(km)	Direction	Last Surface Rupture	Status*[4]	Maximum Credible Earthquake[5]
Rogers Creek	5 (9)	E	Holocene	Active	7
San Andreas	16 (25)	W	Historic	Active	8
Hayward	20 (33)	SE	Historic	Active	7.5
Napa	20 (33)	E	Recent	Active	--
Green Valley	26 (42)	E	Holocene	Active	6.75
Maacama	25 (40)	N	Holocene	Active	7.25
Concord	35 (56)	SE	Historic	Active	6.5
Clayton	43 (69)	SE	Holocene	Active	--
Pleasanton	46 (73)	SE	Holocene	Active	--
Vaca	38 (61)	E	Late Quaternary	Conditionally Active	6.75
Hunting Creek	36 (58)	NE	Holocene	Active	6.75

*Faults showing displacement during Holocene time are considered active, faults showing evidence of displacement during Late Quaternary time are considered conditionally active.

[3] California Historical Earthquake Online Database, California Geological Survey, 2007, obtained from http://www.consrv.ca.gov/CGS/rghm/quakes/historical/index.htm

[4] California Division of Mines and Geology, Fault Activity Map of California and Adjacent Areas, 1994, Geologic Data Map number 6.

[5] Mualchin, Lalliana, Technical Report to Accompany Caltrans California Seismic Hazards Map, July 1996, California Department of Transportation Engineering Service Center, Office of Earthquake Engineering.

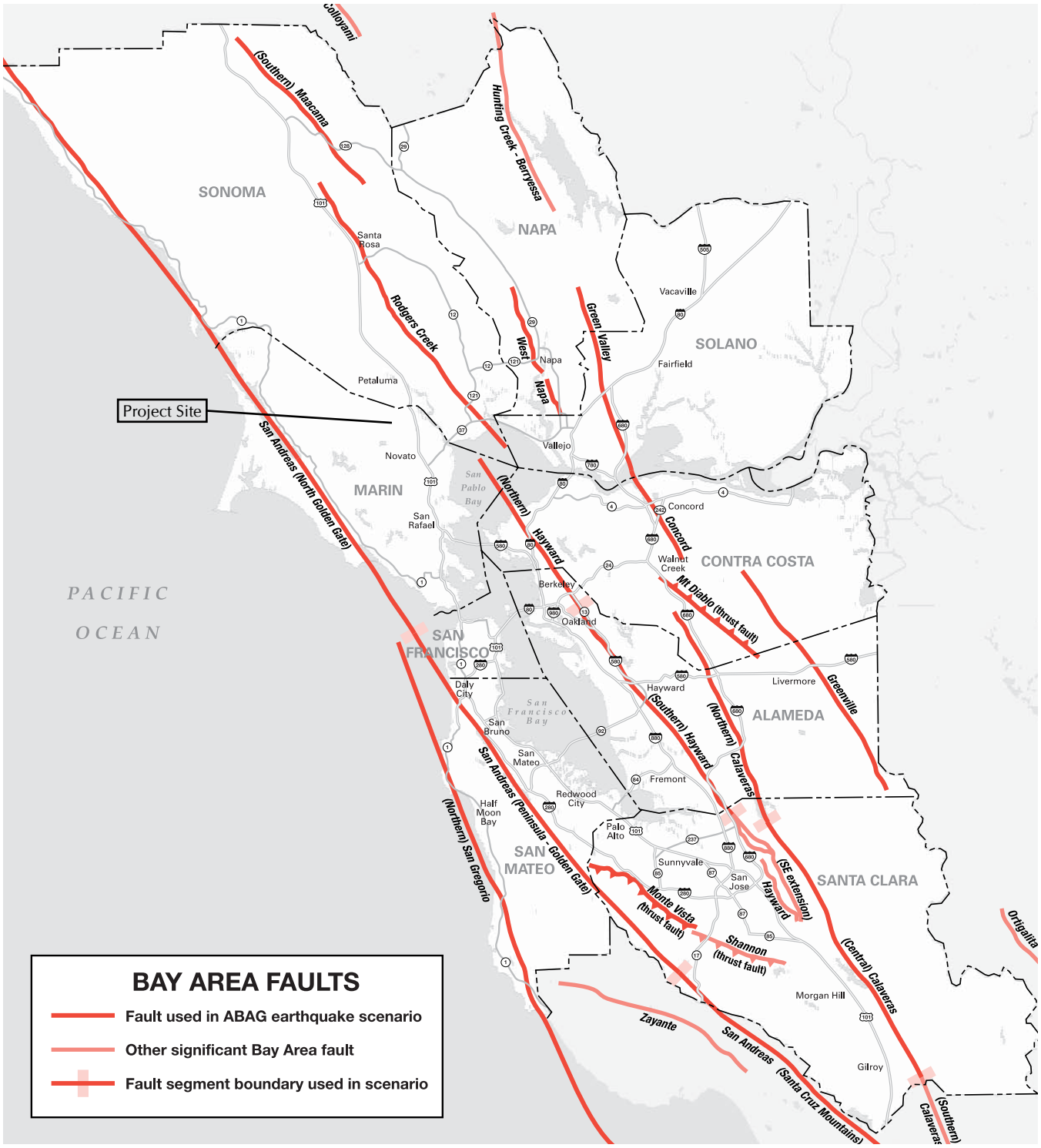

Figure 8-1
Regional Fault Locations

Source: ABAG, 2003

These listed faults are considered active, and could generate an earthquake that would shake the ground throughout the region. Strong ground shaking and associated ground failure represent the largest seismic hazards throughout the Bay Area, including in the City of Petaluma. The intensity of ground shaking at any particular site is a function of many factors including earthquake magnitude; distance from the epicenter; the duration of strong ground motion; local geologic conditions (soil characteristics and topography); and depth to bedrock.

August 2014 West Napa Fault

On August 24, 2014, the northern San Francisco Bay Area was struck by the largest earthquake to impact the Bay Area since the 1989 Loma Prieta earthquake. The earthquake ruptured on or just west of mapped traces of the West Napa Fault, the most seismically active of the faults mapped between the longer Rodgers Creek Fault on the west and the Concord-Green Valley Fault to the east. USGS has named the earthquake the "South Napa earthquake." The South Napa earthquake caused significant damage in south Napa County, and occurred in the broad zone of deformation that accommodates the relative motion of the North American and Pacific Plates. Preliminary USGS analysis of the seismic recordings indicates the earthquake rupture propagated to the north-northwest and upward, directing the brunt of the earthquake energy to the north-northwest towards Napa and away from Petaluma. The dozens of aftershocks that have been recorded to date are also aligned on this north-northwest trend. Geologic investigations and fault mapping efforts associated with this quake are ongoing.

Seismically-Induced Ground Shaking

Due to the proximity of the Project site to active seismic sources, the Probabilistic Seismic Hazards Assessment for the State of California[6] concluded that peak ground acceleration for the area is approximately 49.4 percent of the acceleration due to gravity, with a 10 percent probability of being exceeded during the next 50 years. This corresponds to a Modified Mercalli Intensity as high as VIII, considered "very strong". The implications of this scale are listed in **Table 8-3**.

[6] California Division of Mines and Geology and United States Geological Survey, 1996, Probabilistic Seismic Hazards Assessment for the State of California (http://www.consrv.ca.gov/cgs/rghm/psha/index.htm)

Table 8-3: Modified Mercalli Earthquake Intensity Scale

Scale	Intensity	Effects
I		Not felt.
II		Felt by persons at rest, on upper floors, or favorably placed.
III		Felt indoors. Hanging objects swing. Vibration like passing of light trucks.
IV		Hanging objects swing. Vibration like passing of heavy trucks. Standing motorcars rock. Windows, dishes, doors rattle. Glasses clink. Crockery clashes. In the upper range of IV, wooden walls and frame creak.
V	Light	Felt outdoors; direction estimated. Sleepers wakened. Liquids disturbed, some spilled. Small unstable objects displaced or upset. Doors swing, close, open. Shutters, pictures move. Pendulum clocks stop, start, change rate.
VI	Moderate	Felt by all. Many frightened and run outdoors. Persons walk unsteadily. Windows, dishes, glassware broken. Objects fall off shelves. Pictures off walls. Furniture moved or overturned. Weak plaster and poorly constructed or weak masonry cracked. Trees, bushes shaken (visibly, or heard to rustle).
VII	Strong	Difficult to stand. Noticed by drivers of motorcars. Hanging objects quiver. Furniture broken. Damage to poorly constructed or weak masonry. Weak chimneys broken at roofline. Fall of plaster, loose bricks, stones, tiles, and cornices. Some cracks in average unreinforced masonry. Waves on ponds; water turbid with mud. Small slides and caving in along sand or gravel banks. Large bells ring. Concrete irrigation ditches damaged
VIII	Very Strong	Steering of motorcars affected. Damage to average masonry and partial collapse. Some damage to reinforced masonry, but not to that specially designed for seismic loading. Fall of stucco and some masonry walls. Collapse of chimneys, factory stacks, monuments, towers, and elevated tanks. Frame houses moved on foundations if not bolted down; loose panel walls thrown out. Decayed piling broken off. Branches broken from trees. Changes in flow or temperature of springs and wells. Cracks in wet ground and on steep slopes.
IX	Violent	General panic. Poorly built or weak masonry destroyed; average unreinforced masonry heavily damaged, sometimes with complete collapse; reinforced masonry seriously damaged. (General damage to foundations.) Frame structures, if not bolted, shifted off foundations. Frames racked. Serious damage to reservoirs. Underground pipes broken. Conspicuous cracks in ground. In alluvial areas sand and mud ejected, earthquake fountains, sand craters.
X	Very Violent	Most masonry and frame structures destroyed with their foundations. Some well-built wooden structures and bridges destroyed. Serious damage to dams, dikes, embankments. Large landslides. Water thrown on banks of canals, rivers, lakes, etc. Sand and mud shifted horizontally on beaches and flat land. Rails bent slightly.
XII	Very Violent	Rails bent greatly. Underground pipelines completely out of service.
XII	Very Violent	Damage nearly total. Large rock masses displaced. Lines of sight and level distorted. Objects thrown into the air.

Geologic Conditions

Regional Geology

The Project site is located within the Coast Ranges Geomorphic Province of Northern California. The Coast Range is a geologically complex and seismically active region characterized by a series of northwest-southeast trending mountain ranges with ridges and valleys that roughly parallel the Pacific coast. The Franciscan Complex of Jurassic-Cretaceous age is the oldest bedrock unit. Subsequently, younger rocks such as Pliocene-age Sonoma Volcanics, Pliocene-age marine sediments and Quaternary Alluvium were deposited throughout the province. Extensive folding and thrust faulting during late Cretaceous through early Tertiary time created the complex geologic conditions that underlie the highly varied topography today. The City of Petaluma is located within the Petaluma Valley, a northwest-southeast trending structural depression that roughly follows the Hayward-Rogers Creek fault zone, located approximately five miles northeast of the Project site. Within the Petaluma Valley, the Pliocene marine bedrock is overlain by Quaternary alluvium and non-marine terrace deposits.[7]

Site Geology and Soils

The Project site is located within the Petaluma Valley, near the Petaluma River. The Petaluma Valley is located between the Sonoma Mountains to the northeast and the Coast Ranges to the southwest. Surficial geology at the site consists of Holocene-age alluvial deposits[8]. The alluvial deposits are latest Holocene (<1,000 years) stream terrace deposits immediately west of the Petaluma River. These stream terraces were deposited as point-bar and overbank deposits, and are composed of moderately sorted clayey sand and sandy clay with gravel.[9] Bedrock at depth consists of light gray to light yellow brown marine sandstone of the late Miocene-age Wilson Grove formation,[10] and the Jurassic- to Cretaceous-age Franciscan Formation, which is a rapidly deposited and complexly deformed mixture of clastic sedimentary, and altered mafic volcanic rocks, with some chert, limestone, and subordinate amounts of metamorphic rocks.[11]

Soils at the Project site have characteristics that create constraints on urban development, add to the risk of seismic hazard, and influence hydrology because of their shrink-swell potential and high groundwater levels. As shown on **Figure 8-2**, the U.S.D.A. Natural Resource Conservation Service Soils Survey for Sonoma County identifies four mapped soil types on the site: [12]

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7 California Division of Mines and Geology, 1963, Geologic Map of California, Santa Rosa Sheet.

8 United Soil Engineering, Inc., "Geotechnical Investigation and Pavement Design for Proposed Residential Development 150 Graylawn Avenue, Petaluma, CA", October 21, 2003

9 Quaternary Geology and Liquefaction Susceptibility, Napa, California 1:100,000 quadrangle, US Geological Survey Open-File Report 98-460 obtained from http://pubs.usgs.gov/of/1998/of98-460/

10 Clahan, K, Bezore, S, Koehler, R, and Witter, R. Geologic Map of the Cotati 7.5 Minute Quadrangle, Sonoma County, California, A Digital Database, 2003, California Geological Survey.

11 United Soil Engineering, Inc., Geotechnical Investigation and Pavement Design for Proposed Residential Development, Graylawn Avenue, Petaluma, CA, October, 2003.

12 United States Department of Agriculture, Natural Resources Conservation Service, Web Soil Survey for Sonoma County. Obtained from http://websoilsurvey.nrcs.usda.gov/app/WebSoilSurvey.aspx on October 23, 2007.

Figure 8-2
Project Site Soil Types

Source: USDA Natural Resource Conservation Service, Web Soil Survey, on line

- Clear Lake Clay, 0 to 2 percent slopes covers the central portion of the site west of the river; U.S.D.A. soil descriptions for these soils units indicate these are deep, poorly drained soils that formed in alluvium derived from sedimentary rock. Possible constraints to development include a high expansion index.
- Clear Lake Clay, 2 to 5 percent slopes cover the area surrounding the river at the north end of the site. Same soil description as Clear Lake Clay 0 to 2% slope (above).
- Yolo Clay Loam, 0 to 2 percent slopes covers the southwestern portion of the site. The U.S.D.A. soil description for this soil unit indicates this is a deep, poorly drained soil that formed in alluvium derived from sedimentary rock. Possible constraints to development include a high expansion index.
- Arbuckle Gravelly Loam covers the area west of the river and north of the terminus of Graylawn Avenue. The U.S.D.A. soil description for this soil unit indicates this is a very deep, well-drained soil that formed from alluvium derived from sedimentary rock. Possible constraints to development include a low to moderate expansion index.

Regulatory Setting

Federal Regulations

Disaster Mitigation Act of 2000

On October 30, 2000, the President of the United States signed into law the Disaster Mitigation Act (DMA) of 2000 (Public Law 106-390). DMA 2000 amended the Robert T. Stafford Disaster Relief and Emergency Assistance Act by repealing the previous mitigation planning provisions (Section 409) and replaced them with a new set of requirements (Section 322). The law emphasizes the need for state, tribal, and local entities to coordinate disaster mitigation planning and implementation efforts closely.

Section 322 emphasizes the need for coordination between state, local and tribal levels on hazard mitigation by adding incentives for states that demonstrate an increased commitment to comprehensive mitigation planning and implementation. It also established a requirement for local hazard mitigation plans (as discussed above), and authorized Hazard Mitigation Grant Program funds to be available to a state for the development of these plans. Provisions of the DMA 2000 also include the establishment of performance-based standards for mitigation plans, wherein counties that fail to develop an infrastructure mitigation plan will have their federal share of damage assistance reduced from 75 percent to 25 percent if there were recurrent damage to the same facility or structure in response to the same type of disaster.

State of California

Alquist-Priolo Earthquake Fault Zoning Act

The California Legislature passed the Alquist-Priolo Earthquake Fault Zoning Act in 1972 to mitigate the hazard of surface faulting to structures. The act's main purpose is to prevent the construction of buildings used for human occupancy on the surface trace of active faults. The act addresses only the hazard of surface fault rupture, and its provisions are not directed toward other earthquake hazards. Local agencies must regulate most development in fault zones established by the State Geologist.

California Seismic Hazards Mapping Act

The California Seismic Hazards Mapping Act of 1990 (California Public Resources Code Sections 2690-2699.6) addresses seismic hazards other than surface rupture, such as liquefaction and seismically induced landslides. The Seismic Hazards Mapping Act specifies that the lead agency for a project may withhold development permits until geologic or soils investigations are conducted for specific sites and mitigation measures are incorporated into plans to reduce hazards associated with seismicity and unstable soils.

California Building Code

The California Building Code (CBC) has been adopted by most jurisdictions in California to provide minimum standards for construction. The Petaluma City Council adopted the California Building Code of 2016 based upon the International Building Code of 2015. The CBC defines four Seismic Zones in California, which are ranked according to their seismic hazard potential. Zone 1 has the lowest seismic potential, and Zone 4 has the highest seismic potential. Petaluma is located in Seismic Zone 4, and thus development is required to comply with all design standards applicable to Seismic Zone 4.

The earthquake protection law (California Health and Safety Code section 19100 et. seq.) requires that structures be designed to resist stresses produced by lateral forces caused by wind and earthquakes. Specific minimum standards for seismic safety and structural design to meet earthquake protection requirements are set forth in CBC Chapter 16, Structural Design Requirements, Division IV (which discusses structural earthquake design), and Chapter 18 regarding foundations and retaining walls.

Local Regulations

Local Hazard Mitigation Plan

In order to maintain compliance with Disaster Mitigation Act of 2000 and receive full federal funding, the Association of Bay Area Governments (ABAG) received funds from the Federal Emergency Management Agency (FEMA) to serve as the lead agency in the creation of a Local Hazard Mitigation Plan for the nine-county San Francisco Bay Area. With participation from Petaluma and other Bay Area cities, ABAG produced an umbrella Hazard Mitigation Plan entitled “Taming Natural Disasters.” The City of Petaluma subsequently developed an annex to the plan, which includes a brief explanation of their planning process, an assessment of hazards and risks, and a discussion of mitigation priorities and activities.[13]

City of Petaluma General Plan

The City of Petaluma’s General Plan 2025 includes polices and implementation measures designed to protect the community from any unreasonable risks associated with natural disasters including the effects of seismically induced surface rupture, ground shaking, ground failure, tsunami, seiche, dam failure, slope instability leading to mudslides and landslides, subsidence, liquefaction, and other seismic and geologic hazards; flooding; and wildland and urban fires.

The General Plan 2025 addresses evacuation routes, traffic congestion, peak occupant and traffic loads for structures, water supply requirements, and minimum road widths and clearance around structures

[13] Association of Bay Area Governments Multi-Jurisdictional Local Hazard Mitigation Plan obtained from http://quake.abag.ca.gov/mitigation/plan.html

as those items relate to identified fire and geologic hazards. The intent of the state-mandated safety element is to ensure that local governments develop the regulatory tools necessary to protect public health, safety, and welfare against disasters and hazards.[14]

City of Petaluma Municipal Code

The Project site is in California Building Code Seismic Zone 4, and construction would be required to meet the most stringent CBC standards. CBC Section 1629, Criteria Selection, requires Near-Source Factors for Seismic Source Type A to be applied to the design of proposed structures.

Chapter 18 of the Petaluma Building Code requires a geotechnical foundation investigation during the project-planning phase for new construction intended for human occupancy. The detailed geotechnical and foundation investigations include site preparation and earthwork, grading, slab-on-grade construction, drainage, pavements, foundation types, retaining walls, seismic design, slope protection, ongoing engineering and foundation investigation, and review during the design, grading, and construction phases of the proposed project. The investigations must be performed by California-licensed geologists and engineers as part of the design phase of each project and the report would be required prior to the time of building permit issuance. At a minimum, the investigations must provide information and recommendations for the following items:

- Characteristics of the soil materials below the construction site;
- Most appropriate type of foundation for the proposed structure;
- Static and dynamic design criteria for the recommended foundation type;
- Estimated foundation settlement rate;
- Necessary subgrade preparation for the foundation;
- Lateral pressures for retaining walls;
- Design slopes for cut and fill sections; and
- Suitability of on-site soils for use as backfill.

The recommendations of the foundation and structural reports prepared for the construction of the project or equivalent measures should be incorporated in the final design of each structure, contingent upon concurrence by the City's Engineer. Earthquake-resistant design and materials must meet or exceed the current seismic engineering standards of the CBC Seismic Zone 4 requirements.

Both the 2003 United Soil Engineering's geotechnical investigation and the 2015 RGH Consultants' updated geotechnical engineering reports include the investigations and recommendation requirements of the Petaluma Building Code for the Project's planning phase. Subsequent design-level reports will be provided prior to issuance of any grading or building permit.

Impact Analysis

The following section summarizes geologic, soils and seismic impacts associated with the Sid Common Apartments Project in Petaluma, California. Certain conditions, such as expansive soils, may be practically mitigated through suitable foundation engineering, drainage controls, and other measures, while the often unpredictable nature of geologic hazards, such as strong or violent seismic shaking from

[14] Petaluma General Plan obtained from http://cityofpetaluma.net/cdd/plan-general-plan.html

an earthquake, may only be mitigated to an acceptable standard or level of risk. Typical geologic- and soils-related constraints on development within the City of Petaluma include strong seismic shaking and basic soil instability, which can lead to settlement, shrinking and swelling of soil, and fissuring or cracking of the ground.

Standards of Significance

In accordance with the California Environmental Quality Act (CEQA), State CEQA Guidelines (including Appendix G), City of Petaluma plans, policies and/or guidelines, and agency and professional standards, the Project's impact would be considered significant if it would:

1. Expose people or structures to potential substantial adverse effects, including the risk of loss, injury or death involving rupture of a known earthquake fault, as delineated on the most recent Alquist-Priolo Earthquake Fault Zoning Map issued by the State Geologist for the area or based on other substantial evidence of a known fault;
2. Expose people or structures to potential substantial adverse effects, including the risk of loss, injury or death involving strong seismic ground shaking;
3. Expose people or structures to potential substantial adverse effects, including the risk of loss, injury or death involving seismic-related ground failure, including liquefaction;
4. Expose people or structures to potential substantial adverse effects, including the risk of loss, injury or death involving landslides;
5. Be located on expansive soil, creating substantial risks to life and property;
6. Result in the loss of topsoil or be developed in an area of erodible soils.
7. Be located in areas where soils are incapable of adequately supporting the use of septic tanks or alternative wastewater disposal systems where sewers are not available for the disposal of wastewater;
8. Result in the loss of mineral resources important to the State of California or the local economy;

Surface Fault Rupture

Geo-1: The Project would not expose people or structures to potentially substantial adverse effects involving rupture of a known earthquake fault, as delineated on the most recent Alquist-Priolo Earthquake Fault Zoning Map or other substantial evidence. (**Less than Significant**)

A number of active and potentially active faults are present in the region. According to the State of California Geological Survey, active faults are those that have experienced surface rupture in the past 11,000 years (Holocene). The Alquist-Priolo Earthquake Fault Zoning Act of 1972 initiated a program of mapping active or potentially active (displacement during Quaternary time – the past 1.6 million years) faults throughout the state of California. According to the program, active faults must be zoned and development projects within the Earthquake Fault Zones (EFZ) investigated to establish the location and age of any faulting across the site. Active and potentially active faults in Sonoma County have undergone extensive investigation in the past. The Association of Bay Area Governments (ABAG) has summarized the results from many of these studies to quantify the potential impact to certain areas, while the California Geological Survey has established EFZ boundaries.

The Project site is not within an EFZ. The nearest EFZ is for the Rogers Creek-Healdsburg Fault Zone, located approximately five miles northeast of the Project site.[15] Since no faults are mapped across the Project site on any published maps, ground rupture at the Project site resulting from an earthquake is unlikely, and the risk of ground rupture within the Project boundaries is considered very low.

Exposure to Strong Seismic Ground Shaking

Geo-2: The Project could expose people or structures to potentially substantial adverse effects involving strong seismic ground shaking. (**Less than Significant with Mitigation**)

The San Francisco Bay area is a seismically active region and experts consider it likely that the Project site will be subjected to at least strong seismically induced shaking during the design life of the development. According to a recent study completed by the Working Group on California Earthquake Probabilities (WGCEP), there is a 62 percent chance that a Richter Magnitude 6.7 or greater earthquake will occur on one of the major faults in the region. As such, seismically induced ground shaking is anticipated at the Project site in the foreseeable future.

The intensity of ground shaking would vary with the distance and magnitude of the earthquake causing the shaking. There is likely to be at least strong seismically induced ground shaking at the Project site from an earthquake on the Roger's Creek-Healdsburg, Hayward, San Andreas, or Maacama Faults. Strong to violent seismic ground shaking is considered a potentially significant impact. To address the hazards associated with strong seismic ground shaking, compliance with existing Building Code regulations is required.

Geotechnical Investigation Recommendations

Pursuant to the Petaluma Building Code requirements, two Geotechnical Investigations have been prepared, the 2003 United Soils Engineering Report (**Appendix 8A**) and the 2015 RGH Consultant's Update (**Appendix 8C**). The 2015 RGH Update noted that, based on a reconnaissance of the site, the general geologic conditions do not appear to have changed significantly from those described in the 2003 USE report. However, the seismic design criteria presented in the 2003 USE report was based on the 1997 Uniform Building Code, whereas the 2013 California Building Code (CBC) was applicable at the time the report was conducted. Therefore, the 2015 RGH Update presents seismic design parameters for the Project based on Section 1613: Earthquake Loads of the 2013 CBC.

Based on Table 20.3-1 of American Society of Civil Engineers (ASCE) Standard 7-10 (ASCE, 201 0), the 2015 RGH Update (**Appendix 8C**) has determined that Site Class "D" should be used as the design basis for the site. Based on the site location and U.S. Seismic Design Maps from the United States Geological Survey (USGS) website[16], the 2015 RGH Consultant's Update recommends that the following seismic design criteria be used for structures at the site: [17]

Spectral Response Parameter:	Acceleration (g):
• S_S (0.2 second period)	1.576
• S_1 (1 second period)	0.619

[15] Official Map of the Alquist-Priolo Earthquake Fault Zones of California, Glen Ellen 7.5 minute quadrangle

[16] http://geohazards.usgs.gov/designmaps/us/application.php

[17] RGH Consultants, 2015, pgs. 2 and 3

- S_{MS} (0.2 second period) 1.576
- S_{M1} (1 second period) 0.928
- S_{DS} (0.2 second period) 1.051
- S_{D1} (1 second period) 0.619

Mitigation Measures

Pursuant to existing regulatory requirements, the following mitigation measures will be implemented by the Project:

Mitigation Measure Geo-2A: Compliance with California Building Code. Project development shall meet all requirements of the California Building Code Vols. 1 and 2, 2016 Edition, including the California Building Standards, 2015 Edition published by the International Conference of Building Officials (or most recent edition at the time of development), and as modified by the amendments, additions and deletions as adopted by the City of Petaluma.

Mitigation Measure Geo-2B: Incorporation of Geotechnical Investigation Recommendations. Consistent with Chapter 18 of the Petaluma Building Code requirements, the recommendations of the RGH Consultants' Geotechnical Engineering Report Update for Sid Commons (January 20, 2015) regarding foundation and structural design, or equivalent measures, shall be incorporated in the final design of each structure, contingent upon concurrence by the City's Engineer and Chief Building Official. To ensure that appropriate construction techniques are incorporated, the City's Geotechnical Engineer shall inspect the construction work and certify to the City, prior to issuance of a certificate of occupancy, that all improvements have been constructed in accordance with the approved Geotechnical Investigation specifications.

Resulting Level of Significance

Incorporation of seismic construction standards as required by the regulatory requirements identified in Mitigation Measures Geo-2A and -2B would reduce the potential for catastrophic effects of ground shaking, such as structural failure. These construction standards will not completely eliminate the hazard of seismically induced ground shaking, but will reduce the hazards to a level considered acceptable by the state of California for reducing seismic risks to acceptable levels, and therefore to a level of less than significant.

Liquefaction

Geo-3: The Project would not expose people and structures to potentially substantial adverse effects involving seismic-related ground failure, including liquefaction. (**Less than Significant**)

Liquefaction is a rapid loss of shear strength experienced in saturated, predominantly granular soils below the groundwater level during strong earthquake ground shaking, due to an increase in pore water pressure. The occurrence of this phenomenon is dependent on many complex factors including the intensity and duration of ground shaking, particle size distribution and density of the soil.

The most current published liquefaction susceptibility map indicates that a portion of the Project site that is proposed for development and for terracing along the Petaluma River is located within an area of high liquefaction potential.[18] Additionally, maps prepared by ABAG (see **Figure 8-3**) indicate that soils located within the Project site generally south of the existing terminus of Graylawn Avenue have a very low susceptibility to liquefaction, but that there are portions of the Project site (specifically north and west of the Graylawn Avenue and that are associated with the historic floodplain of the Petaluma River) that have a high susceptibility to liquefaction. The Petaluma General Plan 2025 EIR (Figure 3.7-5) also provides a map of geological hazards, which indicates that portions of the Project site are identified as having a very high liquefaction potential. These generalized maps are in contrast to the analysis performed by USE (2003), which indicated a low potential for liquefaction based on one boring performed outside of the liquefaction zone shown in these published maps. [19]

To assess the potential for liquefaction and the extent and consequences of liquefaction if it occurred at the Project site, RGH Engineers performed detailed supplemental geotechnical explorations (**Appendix 8B**).[20] Soil borings and test pits performed for this detailed supplemental exploration were conducted within the mapped high potential liquefaction zone as shown on Figure 8.3, and throughout the remainder of the proposed development areas of the site. These investigations encountered clay soils over Wilson Grove formation bedrock. Clay soils are not considered liquefiable. As a bedrock unit, the Wilson Grove formation would also have no potential for liquefaction. Given that the encountered soils and geologic units do not match with the published liquefaction mapping, RGH also reviewed other published geologic mapping to determine whether current geologic maps might indicate the presence of Wilson Grove formation bedrock. Mapping performed by Bezore et al. (2002) does indicates that the portion of the Project site within the high potential liquefaction zone as shown on Figure 8.3 is underlain by Wilson Grove formation bedrock. Therefore, the RGH subsurface exploration confirmed the mapping by Bezore et al. (2002).

Based on the detailed RGH supplemental geotechnical exploration, the Project site's planned development area and the area within the River terrace do not exhibit a potential for liquefaction. A revised liquefaction susceptibility map for the Project site is presented in **Figure 8-4**. Because these detailed studies indicate no potential for liquefaction within the development areas of the Project site, no mitigation measures are required.

[18] Witter, et al., 2006: and Knudsen, et al., 2000

[19] United Soil Engineering, Inc., Geotechnical Investigation and Pavement Design for Proposed Residential Development, Graylawn Avenue, Petaluma, CA, October 2003.

[20] RGH Consultants, Supplemental Geotechnical Investigation, March 23, 2016

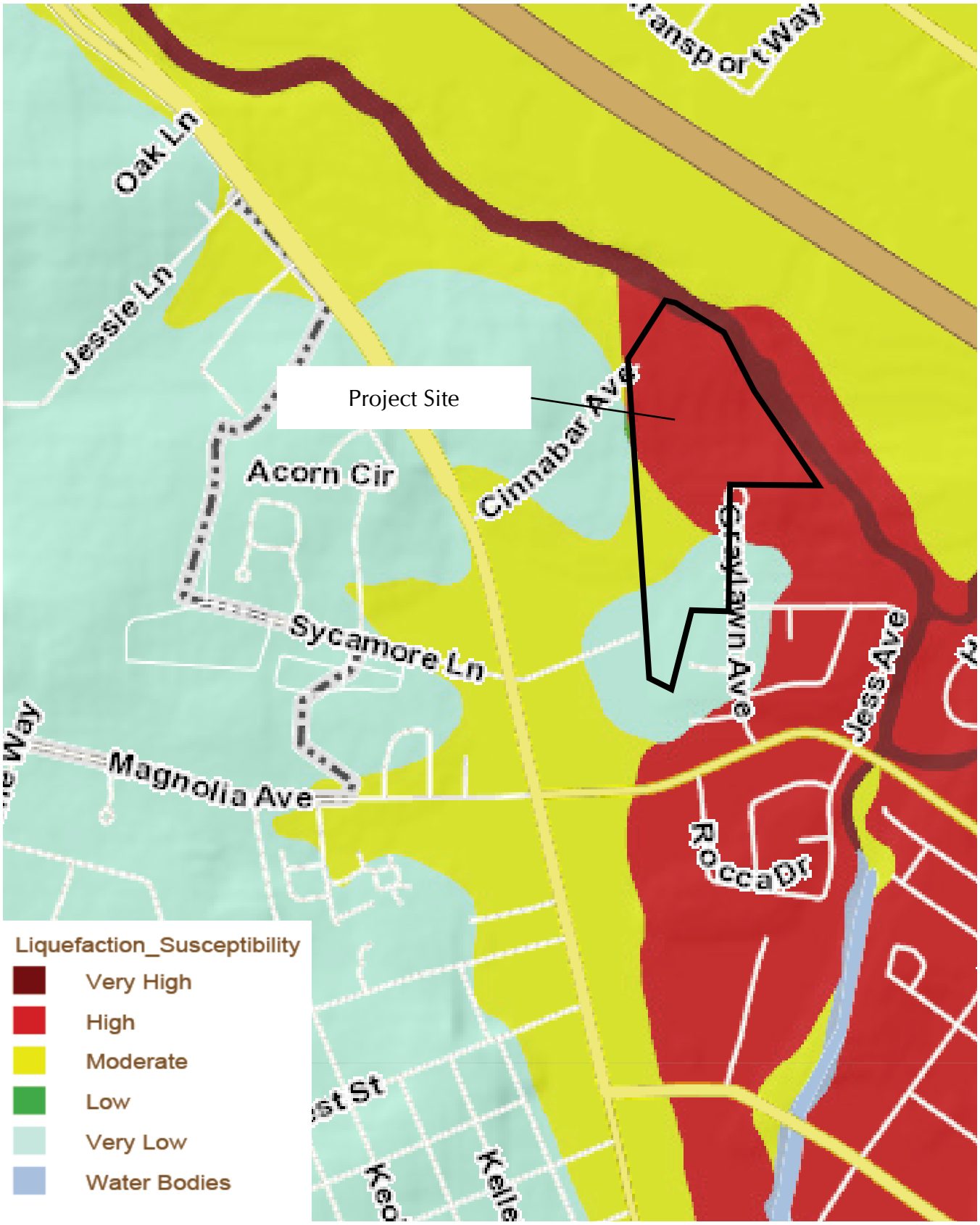

Figure 8-3
Published Liquefaction Susceptibility Map

Source: ABAG Earthquake and Hazards Program, on line

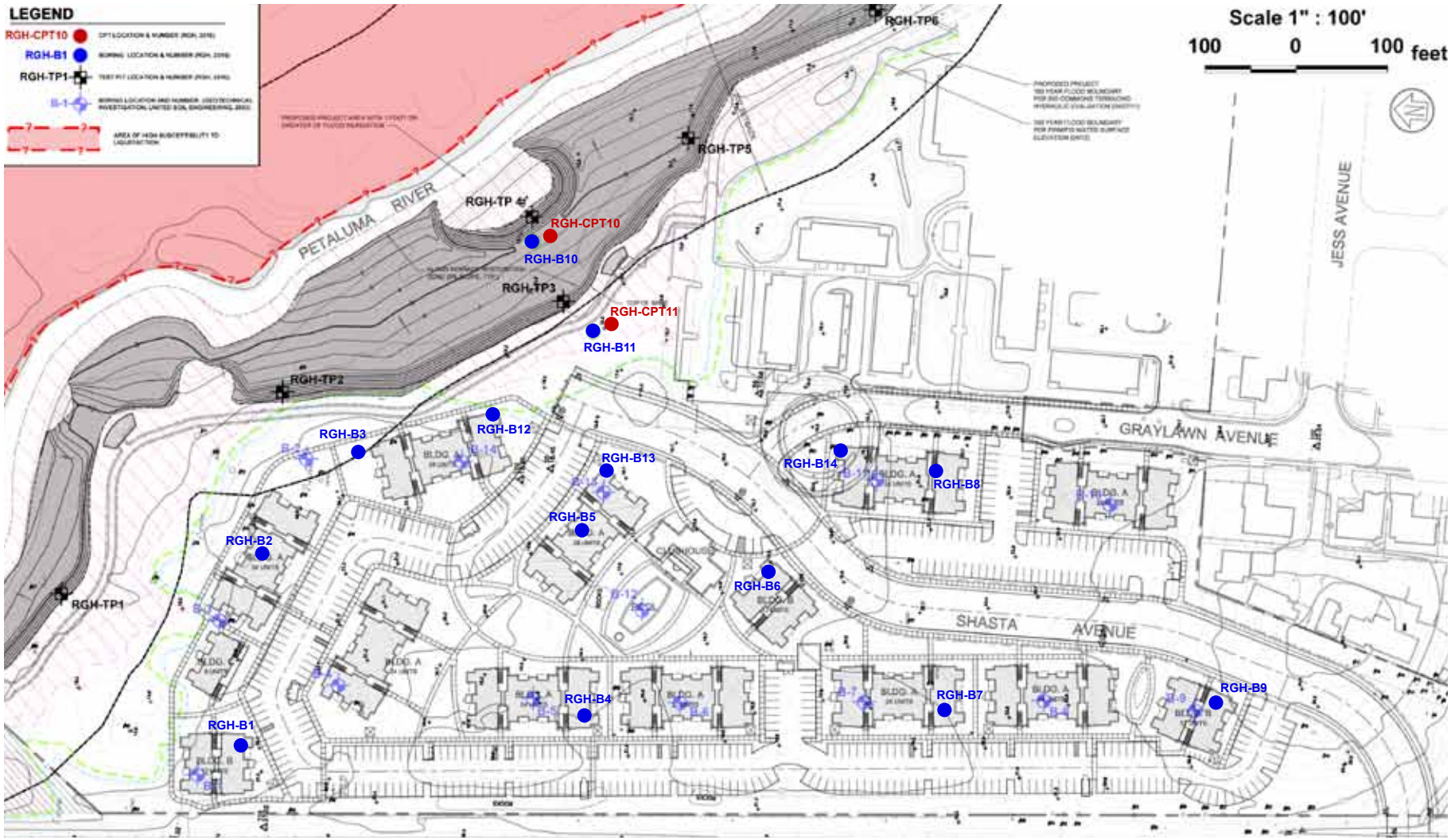

Figure 8-4
Supplemental Evaluation of Liquefaction Susceptibility

Source: RGH Consultants, March 2016

Landslides

Geo-4: The Project would not expose people or structures to potential substantial adverse effects due to the risk of loss, injury or death involving landslides. (**Less than Significant**)

Those portions of the Project site proposed for new development are generally flat and present no potential for landslide hazards. The only portion of the Project site where landslide potential is of concern is along the River bank, where the proposed terracing plan along the Petaluma River may encounter bank instability.

Published geologic maps indicate that the terrace area along the River is generally underlain by Wilson Grove formation bedrock. RGH Engineers' certified engineering geologist confirmed the presence of Wilson Grove bedrock with test pits and by observing exposed features. The presence of this bedrock likely explains why the river turns eastward at the northern end of the Project site. Where this Wilson Grove bedrock is present, the proposed terracing is considered to have stable slopes. Where the River terraced grading may result in exposing this bedrock material, the bedrock will be over-excavated by a few inches, and replaced with fill soils capable of supporting the Project's proposed Habitat Mitigation Monitoring Plan, which provides for habitat replacement and mitigation for impacts caused to riparian habitat, including the creation of new perennial and seasonal wetlands habitat within the terrace and revegetation with native riparian vegetation.

RGH estimates that bedrock will not be exposed along a 100 to 200-foot long section of the River terrace. In order to evaluate the slope stability in this area where bedrock is not encountered, RGH performed slope stability analysis using the computer program SLOPE/W.[21] Two cross sections of the River terraced grading concept were used in this analysis. Slope stability analysis under static (non-seismic) loading conditions is evaluated based on a Factor of Safety of 1.5. Slopes that have a Factor of Safety greater than 1.5 are considered stable. In order to perform the analysis, engineering properties include the effective internal friction angle and the effective cohesion for the exposed materials along the exposed finished slope were obtained from tri-axial testing, direct shear testing and correlations based on other engineering properties. This correlation used plasticity index (PI) to estimate the effective internal friction angle. Laboratory testing on the material encountered in the nearest pit to the planned terrace area (RGH-TP5) yielded a PI of 35. Using this PI and other correlations, RGH estimated the effective internal friction angle to be 28 degrees. Based on their experience with similar soils, they estimated the effective cohesion to be 100 pounds per square foot. Using these engineering properties, RGH calculated the Factor of Safety against failure for each section of the River Terrace plan to be greater than 1.5. Therefore, those portions of the terrace where Wilson Grove bedrock is not present are also considered to have stable slopes.[22]

Based on the above information as developed by RGH Consultants, there are no geotechnical hazards related to slope stability for the river terrace and as such, no mitigation measures are required.

Expansive Soils

Geo-5: Portions of the Project site proposed for development contain localized expansive soil, creating substantial risks to property. (**Less than Significant with Mitigation**)

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[21] GEO-SLOPE International, Ltd., 2005

[22] RGH Consultants, Supplemental Geotechnical Investigation, March 23, 2016

Expansive clay soils are potentially damaging to foundations since they shrink and swell in response to changes in moisture content throughout the yearly weather cycle. Near the surface, the resulting movement can lead to cracking and settlement of lightly loaded shallow foundations (spread footings) that could eventually undermine structures. Expansive soils can also cause damage to roadways and sidewalks, as well as underground conduits. The zone of significant moisture variation (active layer) is dependent on the expansion potential of the soil and the extent of the dry season. In the Petaluma area, the active layer is generally considered to range in thickness from about 2 to 3 feet.

The Geotechnical Investigation performed by United Soils Engineers in 2003 indicated that site soils have a low expansion potential. However, the United States Department of Agriculture Soil Survey for Sonoma County indicates that expansive clay soils exist in the northern portion of the site and may be present locally. Therefore, site-specific laboratory testing was conducted to assess the potential for presence of expansive soils. [23]

A total of 14 soils borings were conducted at the Project site, including 12 borings drilled specifically in locations where new buildings are proposed to be located pursuant to the Project. These borings encountered four different near surface soils that could be exposed at the surface after grading is complete. These soils exhibit plasticity that ranges from low to high (LL = 34-63; PI = 13-35), and expansion potential that also ranges from low to high (EI = 21-125). The extent of expansive soils observed at the site confirms that expansive soils may be present within 8 of the 14 buildings as proposed pursuant to the Project. These expansive soils can affect the performance of these structures, and this impact is considered potentially significant.

Mitigation Measures

The impacts of expansive soils can be mitigated by grading and/or foundation measures. These mitigation measures are described below.

Mitigation Measure Geo-5A: Soil Treatment. The detrimental effects of expansive soil movements can be reduced by pre-swelling expansive soils and covering them with a moisture fixing and confining blanket of properly compacted non-expansive engineered fill (select fill). Select fill can consist of approved non-expansive on site soils, imported non-expansive materials or lime stabilized on-site clay soils. In building areas, the blanket thickness of select fill required depends on the expansion potential of the soils and the anticipated performance of the foundations and slabs. In order to effectively reduce foundation and slab heave given the expansion potential of the site's soils, a blanket thickness of 30 inches shall be utilized in building areas at the Project site. In exterior slab and paved areas, the select fill blanket need only be 12 inches thick. On-site and imported select fill materials shall have a low expansion potential (EI less than 50), and conform in general to the following requirements:

a) Sieve size of 6 inches – 100% passing (by dry weight)

b) Sieve size of 4 inches – 90% to 100% passing (by dry weight)

c) No. 200 – 10% to 60% passing (by dry weight)

Mitigation Measure Geo-5B: Foundation Design. The Project's proposed structures shall be supported on either post-tensioned slabs or mat slabs. These slabs shall be designed using the expansion

[23] Ibid

characteristics of the soils. Grading to prepare the building pads shall consist of reworking the upper 2 to 3 feet of surface soils by excavating these soils, moisture conditioning them to at least 4 percent above optimum moisture content, and compacting them to at least 90 percent relative compaction, or as otherwise specified by the geotechnical engineer.

Resulting Level of Significance

Implementation of the above mitigation measures will reduce the potential impact of expansive soils to less than significant levels.

Soil Erosion

Geo 6: The Project could result in the loss of topsoil as a result of development on potentially erodible soils (**Less than Significant with Mitigation**)

Grading activities at the Project site will be required to provide level surfaces for roads and structures, excavation of expansive soils at the site will involve disturbing and removing the topsoil. Substantial grading activities will also be necessary to implement the proposed River terracing plan. The total extent of grading activity and overall earthwork pursuant to the Project is indicated in **Table 8-4**, below.

Table 8-4: Earthwork Quantities

	Cut	Fill	Net
Development Area Grading	16,000 CY	26,700 CY	+10,700 CY
River Terracing	21,260 CY	120 CY	-21,140 CY
Trench Spoils	3,000 CY		-3,000 CY
Foundation Spoils	3,700 CY		-3,700 CY
Shrinkage		2,670 CY	+2,670 CY
Total	43,960 CY	29,490 CY	-14,470 CY (Export)

Source: CSW / Stuber-Stroh Engineering Group, Inc., Preliminary Grading and Drainage Plan, Sheet C4, May 1, 2017

According to the Soil Survey for Sonoma County, soils at the Project site are only slightly susceptible to erosion. However, during earthwork activity, topsoil could be mobilized by storm waters and wind, and increase sediment loads in waterways (see also discussion of sedimentation effects in Chapter 11: Hydrology). The River terrace slopes will be especially susceptible to erosion from surface runoff and River flows, and will need to be protected during construction to reduce these impacts. The potential for erosion to occur on the site during construction is a potentially significant impact.

Post-construction, the Project will implement a Habitat Mitigation Monitoring Plan (HMMP) to provide habitat replacement and mitigate impacts caused to riparian habitat and wetlands by the river terrace grading. The HMMP has been designed to create new floodplain terraces, to create and restore riparian habitat, to create new perennial and seasonal wetlands habitat, and to revegetate the graded and re-

contoured terrace area with native riparian vegetation. Upon completion of the HMMP, the revegetated and restored Riverbanks will provide appropriate on-going protection against erosion.

Mitigation Measures

To address potential erosion impacts associated with the Project construction, the following mitigation measure is required.

Mitigation Measure Geo-6: Erosion Control Plan. Prior to issuance of a grading permit, an erosion control plan, along with grading and drainage plans, shall be submitted to the City Engineer for review. All earthwork, grading, trenching, backfilling, and compaction operations shall be conducted in accordance with the City of Petaluma's Subdivision Ordinance (#1046, Title 20, Chapter 20.04 of the Petaluma Municipal Code) and Grading and Erosion Control Ordinance #1576, Title 17, Chapter 17.31 of the Petaluma Municipal Code). These plans shall detail erosion control measures such as site watering, sediment capture, equipment staging and laydown pad, and other erosion control measures to be implemented during construction activity on the project site.

a) The Erosion Control Plan shall include winterization, dust control, erosion control and pollution control measures conforming to the ABAG Manual of Standards for Erosion and Sediment Control.

b) The Erosion Control Plan shall describe the "best management practices" (BMPs) to be used during and following construction to control pollution resulting from both storm and construction water runoff. The Plan shall include locations of vehicle and equipment staging, portable restrooms, mobilization areas, and planned access routes.

c) Recommended soil stabilization techniques include placement of straw wattles, silt fences, berms, and gravel construction entrance areas or other control to prevent tracking sediment onto city streets and into storm drains.

d) Public works staff or representatives shall visit the site during grading and construction to ensure compliance with the grading ordinance and plans, and note any violations, which shall be corrected immediately.

Resulting Level of Significance

Implementation of these mitigation measures would reduce the potential impact of soil erosion during construction to a level of less than significant.

Septic Systems

Geo-7: The Project would not be supported by the use of septic tanks or alternative wastewater disposal systems that would be reliant upon appropriate soil capabilities. (**No Impact**)

A municipal sewer system is present in the area and will be used by the Project. There will be no septic systems introduced on the project site. Therefore, there would be no impact from the use of alternative wastewater disposal system or septic tanks from project implementation.

Loss of Mineral Resources

Geo-8: Development of the Project would not result in the loss of availability of a known mineral resource that would be of value to the region and the residents of the state. (**No Impact**)

There are no known mineral resources on the site. There are no State Mining and Geology Board-designated resource sectors within the Project site or its vicinity. Therefore, there would be no impacts due to the loss of mineral resources from project implementation.

9

Greenhouse Gas Emissions

This analysis evaluates the greenhouse gas (GHG) emission impacts of the Project. The impacts associated with implementation of the Project were evaluated consistent with guidance provided by the Bay Area Air Quality Management District (BAAQMD).[1]

This section utilizes information from the following reports prepared for this Project:

- CalEEMod Emissions Model Version: 2016.3.1, output dated October 3, 2017 (**Appendix 5A**)

Setting

Greenhouse Gas Emissions and Global Climate Change

Climate change is a shift of the "average weather" observed on Earth, and can be measured by such variables as temperature, wind patterns, storms and precipitation. The temperature on earth is regulated by the "greenhouse effect", where naturally occurring gases such as carbon dioxide absorb infrared radiation emitted by the Earth's surface and radiate it back to the surface, thus trapping heat within the atmosphere. Changing the atmospheric abundance or properties of these gases can lead to a warming or cooling of the climate system. Without this naturally occurring greenhouse effect, the Earth's temperature would be about 61 degrees Fahrenheit (34 degrees Centigrade) cooler.

Human activities result in emission of four principal greenhouse gases: carbon dioxide (CO_2), methane (CH_4), nitrous oxide (N_2O), and halocarbons (e.g., fluorine, chlorine, iodine and bromine).

- Natural sources of CO_2 include decomposition of dead organic matter, respiration of plants and animals, evaporation from oceans, and volcanic outgassing. Human activities contribute to CO_2 emissions from the burning of fossil fuels for transportation, building heating and cooling, and the manufacturing of goods. In addition, deforestation releases CO_2 and reduces its uptake by plants.
- Methane is a colorless, odorless gas, and is the principal component of natural gas. It is released naturally through the anaerobic decay of organic matter such as the natural processes that occur in wetlands. Human activities contributing to CH_4 emissions include agricultural activities and landfills.
- Nitrous oxide (commonly known as laughing gas), is a colorless gas with a slightly sweet odor. It is released through natural processes in the soil and oceans. Human activities contribute to N_2O emissions through the use of fertilizers and the burning of fossil fuels.
- Halocarbon compounds are chemicals in which one or more carbon atoms are linked by covalent bonds with one or more halogen atoms. Halocarbon gas concentrations are primarily due to human activities. Halocarbons are best known as gases that deplete the ozone layer, although many are also powerful greenhouse gasses. Under the Montreal Protocol of 1987, emissions of halocarbons

[1] Bay Area Air Quality Management District. May 2011. *California Environmental Quality Act Air Quality Guidelines*.

are tightly controlled, and many dual ozone-depleting and global warming-inducing gases are now decreasing.

For analysis purposes, emissions of these gases are expressed in terms of carbon dioxide equivalents (CO_2e). This is a common unit for combining emissions of greenhouse gases with different levels of impact on climate change. It is a measure of the impact that each gas has on climate change, and is expressed in terms of the potency of carbon dioxide. For carbon dioxide itself, emissions in tons of CO_2 and in tons of CO_2e are the same, but for nitrous oxide and methane (stronger greenhouse gases), one ton of emissions is equal to 310 tons and 21 tons of CO_2e, respectively.

Of all human activities, the burning of fossil fuels is the largest contributor in overall greenhouse gas emissions, releasing CO_2 into the atmosphere. The resulting increases in greenhouse gas emissions from human activities are leading to higher concentrations, and a change in the composition of the atmosphere. During the previous 10,000 years up to 1750, CO_2 measured within the range of 280 ppm (plus or minus 20 ppm). During the industrial era, CO_2 rose to 367 ppm in 1999, 379 ppm in 2005, 395 ppm in 2013, and 400 ppm in 2016.

Many sources and models indicate that temperatures on Earth are increasing, and will continue to warm at unprecedented levels. The global mean surface temperature has increased by 1.1 degrees Fahrenheit since the 19th century, and the 10 warmest years of the last 100 years all occurred within the last 15 years. The Intergovernmental Panel on Climate Change (IPCC) also reports that the average global temperature is expected to rise by 1.1 to 6.4 degrees Centigrade by the end of the 21st century, depending on future greenhouse gas emission scenarios.

GHG Emissions Inventories

Global Emissions

Worldwide emissions of GHGs in 2004 were 49 billion tons of CO_2e per year. Global GHG emissions due to human activities have grown since pre-industrial times, with an increase of 70% between 1970 and 2004.[2]

U.S. Emissions

In 2008, the United States emitted about 7 billion tons of CO_2e, a 14 percent increase from 1990. Emissions per capita have remained nearly level since 1990, as emissions have increased at about the same rate as the population.[3]

State of California Emissions

In 2009, California's net emissions were approximately 453 million metric tons of CO_2e, or about 6.5 percent of the U.S. emissions. This large number is due primarily to the sheer size of California compared to other states. By contrast, California has the fifth lowest statewide per capita GHG emission

[2] Intergovernmental Panel on Climate Change, November 2007, Climate Change 2007: Synthesis Report, Figure 2.1.

[3] U.S. EPA, 2010, *Climate Change Indicators in the United States*, p. 11.

rates in the country. 2009 total net emissions represent a 1.3 percent decrease from 2000 and a 6.1 increase from 1990 emissions levels.[4]

Bay Area Emissions

In 2015, BAAQMD updated its emissions inventory using a base 2011.[5] In the Bay Area, fossil fuel consumption in the transportation sector (on-road motor vehicles, off-highway mobile sources, and aircraft) is the single largest source of the Bay Area's GHG emissions, accounting for 39.7% of the Bay Area's 86.6 million metric tons of GHG emissions in 2011. Industrial and commercial sources were the second largest contributors of GHG emissions with about 35.7% of total emissions. Domestic sources (e.g., home water heaters, furnaces, etc.) account for about 7.7% of the Bay Area's GHG emissions, and energy production accounted for 14.0% percent. Off-road equipment and agriculture make up the remainder with approximately 1.5% and 1.5% of the total Bay Area 2011 GHG emissions, respectively.

Petaluma Emissions

The primary sources of greenhouse gas emissions in Petaluma are residential and commercial buildings (approximately 40 percent of total emissions), transportation (approximately 55 to 59 percent of total emissions), and municipal services and solid waste management (approximately 2 to 5 percent of total emissions). Emissions grew from approximately 10.1 tons per person in 1990 (total = 434,900 tons) to approximately 10.7 tons per person in 2005 (total = 610,400 tons). Absent effective implementation of the policies of the General Plan 2025 intended to reduce greenhouse gas emissions, by 2025 emissions would be approximately 9.9 tons per person (total = 721,600 tons), which indicates that while the total emissions generated in Petaluma would continue to increase, the rate of increase would be reduced from recent levels. However, even with effective implementation of all General Plan 2025 policies/programs and State measures intended to reduce greenhouse gas emissions in Petaluma, these emissions are anticipated to reach 562,600 tons of CO2e in 2025, well above the target value of 326,200 tons established by the City in Resolution 2005-118. [6]

Despite the City's best efforts to identify probable greenhouse gas reductions from State measures and General Plan 2025 policies and programs, not all of the State reduction measures have been formally adopted at this time. Additionally there is a substantial level of uncertainty about their effectiveness and how they will apply to local governments.

Potential Effects of Global Climate Change

Global Effects

Globally, climate change has the potential to impact numerous environmental resources through potential, though uncertain, impacts related to future air temperatures and precipitation patterns. Scientific modeling predicts that continued GHG at or above current rates would induce more extreme

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4 California Energy Commission (CEC), Inventory of California Greenhouse Gas Emissions and Sinks: 1990 to 2009, December 2011.

5 BAAQMD, January 2015, *Bay Area Emissions Inventory Summary Report: Greenhouse Gas Emissions,* available at http://www.baaqmd.gov/~/media/files/planning-and-research/emission-inventory/by2011_ghgsummary.pdf.

6 City of Petaluma, City of Petaluma: General Plan 2025, May 2008, as revised through January 11, 2012, p. 4-13.

climate changes during the 21st century than were observed during the 20th century. A warming of about 0.2°C (0.36°F) per decade is projected, and there are identifiable signs that global warming is taking place, including substantial ice loss in the Arctic. The projected effects of global warming on weather and climate are likely to vary regionally, but are expected to include the following direct effects, according to the IPCC.[7]

- Snow cover is projected to contract, with permafrost areas sustaining thawing.
- Sea ice is projected to shrink in both the Arctic and Antarctic.
- Hot extremes, heat waves, and heavy precipitation events are likely to increase in frequency.
- Future tropical cyclones (typhoons and hurricanes) will likely become more intense.
- Non-tropical storm tracks are projected to move poleward, with consequent changes in wind, precipitation, and temperature patterns. Increases in the amount of precipitation are very likely in high-latitudes, while decreases are likely in most subtropical regions.
- Warming is expected to be greatest over land and at most high northern latitudes, and least over the Southern Ocean and parts of the North Atlantic Ocean.

Potential secondary effects from global warming include global rise in sea level, impacts to agriculture, changes in disease vectors, and changes in habitat and biodiversity.

Effects on the State of California

According to CARB, some of the potential impacts in California of global warming may include loss in snow pack, sea level rise, more extreme heat days per year, more high ozone days, more large forest fires, and more drought years.[8] Several recent studies have attempted to explore the possible negative consequences that climate change, left unchecked, could have in California. These reports acknowledge that climate scientists' understanding of the complex global climate system, and the interplay of the various internal and external factors that affect climate change, remains too limited to yield scientifically valid conclusions on such a localized scale. Substantial work has been done at the international and national level to evaluate climatic impacts, but far less information is available on regional and local impacts. In addition, projecting regional impacts of climate change and variability relies on large-scale scenarios of changing climate parameters, using information that is typically at too general a scale to make accurate regional assessments.[9]

Below is a summary of some of the potential effects reported in an array of studies that could be experienced in California as a result of global warming and climate change.

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[7] International Panel on Climate Change (IPCC) *Special Report on Emissions Scenarios, 2000,* www.grida.no/climate/ipcc/emission/002.htm, accessed July 24, 2007.

[8] California Air Resources Board, December 2006, *Public Workshop to Discuss Establishing the 1990 Emissions Level and the California 2020 Limit and Developing Regulations to Require Reporting of Greenhouse Gas Emissions*.

[9] Kiparsky, M. and P.H. Gleick, July 2003, *Climate Change and California Water Resources: A Survey and Summary of the Literature*.

Air Quality

Higher temperatures, conducive to air pollution formation, could worsen air quality in California. Climate change may increase the concentration of ground-level ozone, but the magnitude of the effect, and therefore its indirect effects, are uncertain. For other pollutants, the effects of climate change and/or weather are less well studied, and even less well understood.[10] If higher temperatures are accompanied by drier conditions, the potential for large wildfires could increase, which, in turn, would further worsen air quality. However, if higher temperatures are accompanied by wetter, rather than drier conditions, the rains would tend to temporarily clear the air of particulate pollution and reduce the incidence of large wildfires, thus ameliorating the pollution associated with wildfires. Additionally, severe heat accompanied by drier conditions and poor air quality could increase the number of heat related deaths, illnesses, and asthma attacks throughout the State.[11]

Water Supply

Uncertainty remains with respect to the overall impact of global climate change on future water supplies in California. For example, models that predict drier conditions (i.e., parallel climate model [PCM]) suggest decreased reservoir inflows and storage and decreased river flows, relative to current conditions. By comparison, models that predict wetter conditions (i.e., HadCM2) project increased reservoir inflows and storage, and increased river flows.[12]

Hydrology

As discussed above, climate change could potentially affect the amount of snowfall, rainfall and snow pack; the intensity and frequency of storms; flood hydrographs (flash floods, rain or snow events, coincidental high tide and high runoff events); sea level rise and coastal flooding; coastal erosion; and the potential for salt water intrusion. Sea level rise can be a product of global warming through two main processes: expansion of seawater as the oceans warm, and melting of ice over land. A rise in sea levels could result in coastal flooding and erosion and could also jeopardize California's water supply. In particular, saltwater intrusion would threaten the quality and reliability of the state's major fresh water supply that is pumped from the southern portion of the Sacramento/San Joaquin River Delta. Increased storm intensity and frequency could affect the ability of flood-control facilities (including levees) to handle storm events.

Agriculture

California has a $30 billion agricultural industry that produces half the country's fruits and vegetables. The California Climate Change Center (CCCC) notes that higher CO2 levels can stimulate plant production and increase plant water-use efficiency. However, if temperatures rise and drier conditions prevail, water demand could increase; crop-yield could be threatened by a less reliable water supply; and greater ozone pollution could render plants more susceptible to pest and disease outbreaks. In

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10 U.S. EPA, 2010, *Climate Change Indicators in the United States*.

11 California Climate Change Center (CCCC), July 2006, *Our Changing Climate: Assessing the Risks to California,* CEC- 500-2006-077.

12 Brekke, L.D., et al, 2004, "Climate Change Impacts Uncertainty for Water Resources in the San Joaquin River Basin, California." *Journal of the American Water Resources Association*. 40(2): 149–164.

addition, temperature increases could change the time of year that certain crops, such as wine grapes, bloom or ripen, and thus affect their quality.[13]

Ecosystems and Wildlife

Increases in global temperatures and the potential resulting changes in weather patterns could have ecological effects on a global and local scale. In 2004, the Pew Center on Global Climate Change released a report examining the possible impacts of climate change on ecosystems and wildlife.[14] The report outlines four major ways in which it is thought that climate change could affect plants and animals: (1) timing of ecological events; (2) geographic range; (3) species' composition within communities; and (4) ecosystem processes such as carbon cycling and storage.

Regulatory Setting

International and Federal GHG Regulations and Policies

Kyoto Protocol

The United States participates in the United Nations Framework Convention on Climate Change (UNFCCC) (signed on March 21, 1994). The Kyoto Protocol is a treaty made under the UNFCCC and was the first international agreement to regulate GHG emissions. It has been estimated that if the commitments outlined in the Kyoto Protocol are met, global GHG emissions could be reduced by an estimated 5 percent from 1990 levels during the first commitment period of 2008–2012. It should be noted that although the United States is a signatory to the Kyoto Protocol, Congress has not ratified the Protocol and the United States is not bound by the Protocol's commitments.

Copenhagen Summit

The 2009 United Nations Climate Change Conference (Copenhagen Summit) was held in Denmark in December 2009. The conference included the 15 Conference of the Parties to the United Nations Framework Convention on Climate Change, and the fifth meeting of the Parties to the Kyoto Protocol. A framework for climate change mitigation beyond 2012 was to be agreed there. The Copenhagen Accord was drafted by the US, China, India, Brazil, and South Africa on December 18, and judged to be a "meaningful agreement" by the United Stated government. It was "taken note of" but not "adopted" in a debate of all the participating countries the next day, and it was not passed unanimously. The document recognized that climate change is one of the greatest challenges of the present day and that actions should be taken to keep any temperature increases to below 2 degrees Celsius. The document was not legally binding and does not contain any legally binding commitments for reducing CO2 emissions.

Paris Agreement

At their conference in Paris, parties to the UN Framework Convention on Climate Change (Convention) reached an agreement to combat climate change and to accelerate and intensify the actions and

[13] CCCC, July 2006, *Our Changing Climate: Assessing the Risks to California,* CEC- 500-2006-077.

[14] Parmesan, C. and H. Galbraith, November 2004, *Observed Impacts of Global Climate Change in the U.S.*

investments needed for a sustainable low carbon future.[15] The Paris Agreement's central aim is to strengthen the global response to the threat of climate change by keeping a global temperature rise this century well below 2 degrees Celsius above pre-industrial levels and to pursue efforts to limit the temperature increase even further to 1.5 degrees Celsius. Additionally, the agreement aims to strengthen the ability of countries to deal with the impacts of climate change.

The Paris Agreement requires all Parties to make "nationally determined contributions" and to strengthen these efforts in the years ahead. This includes requirements that all Parties report regularly on their emissions and on their implementation efforts. There will also be a global stock take every 5 years to assess the collective progress towards achieving the purpose of the agreement and to inform further individual actions by Parties.

The Paris Agreement was opened for signature on April 22, 2016. The agreement will enter into force 30 days after 55 countries that account for at least 55% of global emissions have deposited their instruments of ratification. As of June 2016, 178 UNFCCC members have signed the treaty, 19 of which ratified it, which is not enough for the treaty to enter into force. As of June 2017, 149 parties have ratified the convention.

Climate Change Technology Program

The United States has historically opted for a voluntary and incentive-based approach toward emissions reductions in lieu of the Kyoto Protocol's mandatory framework. The Climate Change Technology Program (CCTP) is a multi-agency research and development coordination effort (which is led by the Secretaries of Energy and Commerce) that is charged with carrying out the President's National Climate Change Technology Initiative.[16]

U.S. Environmental Protection Agency (U.S. EPA)

On December 7, 2009, EPA issued a final action, under Section 202(a) of the Clean Air Act, finding that six key well-mixed greenhouse gases constitute a threat to public health and welfare, and that the combined emissions from motor vehicles cause and contribute to the climate change problem. Subsequently, EPA has developed standards for greenhouse gas emissions from mobile and stationary sources under the Clean Air Act. Below are some key proposed or completed actions taken to implement Clean Air Act requirements for carbon pollution and other greenhouse gases:

Stationary Sources

- **Clean Power Plan**--On August 3, 2015, the EPA issued the Clean Power Plan, intended to cut greenhouse gas emissions from the power sector by 32 percent below 2005 levels, while also cutting smog-and soot-forming emissions by 20 percent. Implementation of the Clean Power Plan standards is awaiting judicial review.
- **Final Greenhouse Gas Tailoring Rule**--On May 13, 2010, EPA set greenhouse gas emissions thresholds to define when permits under the New Source Review Prevention of Significant

[15] United Nations Framework on Climate Change (web page). http://bigpicture.unfccc.int/#content-the-paris-agreemen Accessed July 11, 2016.

[16] Climate Change Technology Program (CCTP), About the U.S. Climate Change Technology Program (web page), Washington, D.C., last updated April 2006, http://www.climatetechnology.gov/about/index.htm, accessed July 24, 2007.

Deterioration (PSD) and Title V Operating Permit programs are required for new and existing industrial facilities.

Transportation/Mobile Sources

- EPA and the National Highway Traffic Safety Administration (NHTSA) are enacting standards expected to save more than six billion barrels of oil through 2025 and reduce more than 3,100 million metric tons of carbon dioxide emissions.
- EPA is also responsible for developing and implementing regulations to ensure that transportation fuel sold in the United States contains a minimum volume of renewable fuel.

Emissions Reporting--The Greenhouse Gas Reporting Program collects greenhouse gas data from large emission sources across a range of industry sectors, as well as suppliers of products that would emit greenhouse gases if released or combusted. Greenhouse gas data are available through the Greenhouse Gas Reporting Program Data Publication Tool.

State of California GHG Regulations and Policies

Senate Bill 97—Modification to the Public Resources Code

Pursuant to Senate Bill 97, the California Natural Resources Agency reviewed and adopted the amendments to the CEQA Guidelines on December 30, 2010 prepared and forwarded by the Governor's Office of Planning and Research (OPR). The Amendments became effective on March 18, 2010, including the addition of the GHG emissions environmental topic and checklist items.

AB 32 and the Air Resource Board's Climate Change Scoping Plan

The State of California passed the Global Warming Solutions Act of 2006 (AB 32), which seeks to reduce GHG emissions generated by California to achieve 1990 emissions levels by the year 2020. Executive Order S-3-05 further requires that California's GHG emissions be 80 percent below 1990 levels by the year 2050. The California Air Resources Board (CARB) is the lead agency for implementing AB 32.

In accordance with provisions of Assembly Bill 32 (AB 32), CARB completed a statewide GHG Inventory that provides estimates of the amount of GHGs emitted to, and removed from, the atmosphere by human activities within California. In accordance with requirements of AB 32, a Scoping Plan was adopted by CARB in December 2008, which contains the main strategies California will implement to achieve reduction of approximately 169 million metric tons of CO_2e, or approximately 30% from the state's projected 2020 emission level of 596 million metric tons of CO_2e under a business-as-usual scenario (this is a reduction of 42 million metric tons CO_2e, or almost 10%, from 2002-2004 average emissions). The Scoping Plan also includes ARB-recommended GHG reductions for each emissions sector of the state's GHG inventory. The Scoping Plan calls for the largest reductions in GHG emissions to be achieved by implementing the following measures and standards:

- improved emissions standards for light-duty vehicles (estimated reductions of 31.7 million metric tons CO_2e);
- the Low-Carbon Fuel Standard (15.0 million metric tons CO_2e);
- energy efficiency measures in buildings and appliances and the widespread development of combined heat and power systems (26.3 million metric tons CO_2e); and
- a renewable portfolio standard for electricity production (21.3 million metric tons CO_2e).

The existing adopted Scoping Plan specifically identifies 18 emissions reduction measures that address cap-and-trade programs, vehicle gas standards, energy efficiency, low carbon fuel standards, renewable energy, regional transportation-related greenhouse gas targets, vehicle efficiency measures, goods movement, solar roofs program, industrial emissions, high speed rail, green building strategy, recycling, sustainable forests, water and air (California Air Resources Board, December 2008). Key elements for reducing the state's greenhouse emissions to 1990 levels by 2020 include:

- Expanding and strengthening existing energy efficiency programs as well as building and appliance standards;
- Achieving a statewide renewable energy mix of 33 percent;
- Developing a California cap-and-trade program that links with other Western Climate Initiative partner programs to create a regional market system;
- Establishing targets for transportation-related greenhouse gas emissions for regions throughout California, and pursuing policies and incentives to achieve those targets;
- Adopting and implementing measures pursuant to existing State laws and policies, including California's clean car standards, goods movement measures, and the Low Carbon fuel Standard; and
- Creating targeted fees, including a public goods charge on water use, fees on high global warming potential gases, and a fee to fund the administrative costs of the State's long-term commitment to AB 32 implementation.

ARB has not yet determined what amount of GHG reductions it recommends from local government operations; however, the Scoping Plan does state that land use planning and urban growth decisions will play an important role in the state's GHG reductions because local governments have primary authority to plan, zone, approve, and permit how land is developed to accommodate population growth and the changing needs of their jurisdictions (meanwhile, ARB is also developing an additional protocol for community emissions). ARB further acknowledges that decisions on how land is used will have large impacts on the GHG emissions that will result from the transportation, housing, industry, forestry, water, agriculture, electricity, and natural gas emission sectors. The Scoping Plan states that the ultimate GHG reduction assignment to local government operations is to be determined (ARB 2008). With regard to land use planning, the Scoping Plan expects approximately 5.0 million metric tons CO2e will be achieved associated with implementation of SB 375, which is discussed further below.[17]

The Scoping Plan must be updated every five years; its First Update to the Climate Change Scoping Plan was released in May 2014[18]. The Update:

1. Identifies opportunities to leverage existing and new funds to further drive GHG emission reductions through strategic planning and targeted low carbon investments.
2. Defines ARB's climate change priorities for the next five years, and also sets the groundwork to reach long-term goals set forth in Executive Orders S-3-05 and B-16-2012.
3. Details California's progress toward meeting the "near-term" 2020 GHG emission reduction goals defined in the initial Scoping Plan.

[17] Bay Area Air Quality Management District, May 2012, *California Environmental Quality Act Air Quality Guidelines,* Appendix C: Sample Air Quality Setting.

[18] First Update to the Climate Change Scoping Plan, April 2014. http://www.arb.ca.gov/cc/scopingplan/2013_update/first_update_climate_change_scoping_plan.pdf

4. Evaluates how to align the State's "longer-term" GHG reduction strategies with other State policy priorities for water, waste, natural resources, clean energy, transportation, and land use.

California Senate Bill 375 (SB 375)

Governor Schwarzenegger signed SB 375 into law in September 2008 (Chapter 728, Statutes of 2008). The legislation aligns regional transportation planning efforts, regional GHG reduction targets, and land use and housing allocation. SB 375 requires Metropolitan Planning Organizations (MPOs) to adopt a Sustainable Communities Strategy (SCS) or Alternative Planning Strategy (APS) that will prescribe land use allocation in the MPO's regional transportation plan. ARB, in consultation with MPOs, will provide each affected region with reduction targets for GHGs emitted by passenger cars and light trucks in the region for the years 2020 and 2035. These reduction targets will be updated every eight years but can be updated every four years if advancements in emissions technologies affect the reduction strategies to achieve the targets. ARB is also charged with reviewing each MPO's SCS or APS for consistency with its assigned targets. If MPOs do not meet the GHG reduction targets, transportation projects will not be eligible for funding programmed after January 1, 2012.

This bill also extends the minimum time period for the Regional Housing Needs Allocation (RNHA) cycle from 5 years to 8 years for local governments located in an MPO that meets certain requirements. City or County land use policies (e.g., General Plans) are not required to be consistent with the RTP including associated SCSs or APSs. Qualified projects consistent with an approved SCS or APS and categorized as "transit priority projects" would receive incentives under new provisions of CEQA.

2009/2010 Amendments to the CEQA Guidelines

In January 2009, OPR released preliminary proposed amendments to the CEQA Guidelines regarding GHG emissions. No significance threshold was included in the draft and the guidelines afforded the customary deference provided to lead agencies in their analysis and methodologies. The introductory preface to the amendments recommended that CARB set statewide thresholds of significance. OPR emphasized the necessity of having a consistent threshold available to analyze projects, and the analyses should be performed based on the best available information. The proposed revisions included a new section specifically addressing the significance of GHG emissions. The Guidelines called for quantification of GHG emission, stating that the significance of GHG impacts should include consideration of the extent to which the project would result in the following:

- help or hinder compliance with AB 32 goals;
- increase energy use, especially energy use generated by fossil fuel combustion;
- improve energy efficiency; and
- result in emissions that would exceed any applicable significance threshold.

On February 16, 2010, the Office of Administrative Law approved the Amendments, and filed them with the Secretary of State for inclusion in the California Code of Regulations. The Amendments became effective on March 18, 2010. Among the changes included in these recent CEQA Guidelines amendments are guidance for determining the significance of impacts from GHG emissions (CEQA Guidelines Section 15064.4). These guidelines indicate that "The determination of the significance of GHG emissions calls for a careful judgment by the lead agency … A lead agency should make a good-faith effort, based to the extent possible on scientific and factual data, to describe, calculate or estimate the amount of GHG emissions resulting from a project." A lead agency shall have discretion to determine, in the context of a particular project, whether to use a model or other methodology to quantify GHG emissions resulting

from a project, and which model or methodology to use, or whether to rely on a qualitative analysis or performance based standard.

California Green Building Standards Code (CALGreen)

The California Green Building Standards Code (CALGreen) supplements the California Building Standards Code (Title 24) and requires all new buildings in the state to incorporate energy saving features. The current (2016) CALGreen update took effect on January 1, 2017. These comprehensive regulations are targeted to achieve major reductions in greenhouse gas emissions, energy consumption and water use to create a greener California.

CALGreen requires every new building constructed in California to:

- Reduce water consumption by 20 percent
- Divert 65 percent of construction waste from landfills
- Install low pollutant-emitting materials
- Requires separate water meters for nonresidential buildings' indoor and outdoor water use
- Requires moisture-sensing irrigation systems for larger landscape projects
- Requires mandatory inspections of energy systems (e.g., heat furnace, air conditioner and mechanical equipment) for nonresidential buildings over 10,000 square feet to ensure that all are working at their maximum capacity and according to their design efficiencies.

Regional and County GHG Regulations and Policies

Bay Area Air Quality Management District CEQA Guidelines

The Project site falls within the San Francisco Bay Area Air Basin and therefore under the jurisdiction of the Bay Area Air Quality Management District (BAAQMD). BAAQMD provides a document titled *California Environmental Quality Act Air Quality Guidelines* ("Guidelines"), which provides guidance for consideration by lead agencies, consultants, and other parties evaluating air quality impacts in the San Francisco Bay Area Air Basin conducted pursuant to CEQA. The document includes guidance on evaluating and mitigating greenhouse gas emissions impacts.

BAAQMD updated these Guidelines in coordination with adoption of new thresholds of significance on June 2, 2010.[19] The most recent version of the Guidelines is dated May 2012. The updated CEQA Guidelines revised significance thresholds, assessment methodologies, and mitigation strategies for criteria pollutants, air toxics, odors, and greenhouse gas emissions. The June 2010 BAAQMD CEQA Guidelines included thresholds of significance for greenhouse gas emissions. The guidelines identify 1,100 metric tons (MT) of Carbon Dioxide equivalent per year (CO2e/yr.), or 4.6 MT/year per service population (residents/employees) as the numeric emissions level below which a project's contribution to global climate change would be less than "cumulatively considerable."

[19] Bay Area Air Quality Management District. June 2, 2010. News Release http://www.baaqmd.gov/~/media/Files/Communications%20and%20Outreach/Publications/News%20Releases/2010/ceqa_100602.ashx .

The most recent version of the BAAQMD CEQA Guidelines were published May 2017, and includes revisions made to address the Supreme Court's opinion (*California Building Industry Association v. Bay Area Air Quality Management District*, December 2015).[20] The May 2017 Guidelines update does not address outdated references, links, analytical methodologies or other technical information that may be in the forthcoming Guidelines or Thresholds Justification Report. The BAAQMD is currently working to update any outdated information in the Guidelines, and anticipates release of an updated document in early 2018.[21]

2017 Clean Air Plan

The most recent BAAQMD plan for attaining California Ambient Air Quality Standards, the Bay Area 2017 Clean Air Plan (2017 CAP), was adopted by BAAQMD on April 19, 2017. The 2017 CAP includes a wide range of control measures designed to decrease emissions of the air pollutants that are most harmful to Bay Area residents, such as particulate matter (PM), ozone (O_3), and toxic air contaminants (TACs); to reduce emissions of methane and other "super-greenhouse gases (GHGs)" that are potent climate pollutants in the near-term; and to decrease emissions of carbon dioxide by reducing fossil fuel combustion.

The proposed control strategy for the 2017 CAP consists of 85 specific control measures targeting a variety of local, regional and global pollutants. The control measures have been developed for stationary sources, transportation, energy, buildings, agriculture, natural and working lands, waste management, water, and super-GHG pollutants. Implementation of some of the control measures could involve retrofitting, replacing, or installing new air pollution control equipment, changes in product formulations, or construction of infrastructure that have the potential to create air quality impacts.

The BAAQMD CEQA Guidelines set forth criteria for determining consistency with the CAP. In general a project is considered consistent if a) the project supports the primary goals of the CAP, b) includes control measures and c) does not interfere with implementation of the CAP measures.

Plan Bay Area

On July 18, 2013, the Association of Bay Area Governments (ABAG) and the Metropolitan Transportation Commission (MTC) adopted Plan Bay Area, an integrated transportation and land use-use strategy through 2040 that marks the nine-county Bay Area region's first long-range plan to meet the requirements of SB 375. In April 2017, the 2040 Plan Bay Area was released; it was adopted in July 2017.

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[20] In March 2012, the Alameda County Superior Court ordered BAAQMD to set aside use of the significance thresholds within the BAAQMD 2010 CEQA Guidelines and cease dissemination until they complete an assessment of the environmental effects of the thresholds in accordance with CEQA. The Court found that the thresholds, themselves, constitute a "project" for which environmental review is required. In August 2013, the First District Court of Appeal reversed the Alameda County Superior Court's decision. The Court held that adoption of the thresholds was not a "project" subject to CEQA because environmental changes that might result from their adoption were too speculative to be considered "reasonably foreseeable" under CEQA. In December 2015, the California Supreme Court reversed the Court of Appeal's decision and remanded the matter back to the appellate court to reconsider the case in light of the Supreme Court's opinion.

[21] Alison Kirk, BAAQMD, Email Correspondence, June 6, 2017.

San Francisco Bay Conservation and Development Commission

The San Francisco Bay Conservation and Development Commission (BCDC) completed an analysis of potential sea level rise in the San Francisco Bay based on projections of a 16-inch sea level rise by mid-century (2050) and approximately 55-inch sea level rise by the end of the century (2100).[22]

BCDC, the National Oceanic and Atmospheric Administration Coastal Services Center, along with local, regional, state and federal agencies and organizations, nonprofit and private associations engaged in a collaborative planning process called the Adapting to Rising Tides (ART Project). [23] The purpose of the ART Project is to provide a potential methodology on how to assess impacts as well as guidance on developing adaption strategies associated with sea level rise.

City of Petaluma

Climate Action Plan

To address GHG emissions within its boundaries, the City of Petaluma adopted resolutions 2002-117 and 2005-118, which call for the City to participate in the Cities for Climate Protection effort and established greenhouse gas reduction targets of 25 percent below 1990 levels by 2015 for community emissions and 20 percent below 2000 levels by 2010 for municipal government operations. In addition, the City is currently preparing a Climate Action Plan in partnership with the County and other local jurisdictions. This effort will implement General Plan Policy 4-P-27, which calls for preparation of such a plan.

CalGreen

On January 1, 2017, the 2016 California Green Building Standards Code (CALGreen) and the California Energy Code became effective throughout California. The City of Petaluma has adopted by reference the CALGreen and the California Energy Code.[24] The 2016 CALGreen applies to all newly constructed buildings as well as additions and certain alterations. Requirements for all new residences include:[25]

- Storm water drainage and retention during construction.
- Displaced topsoil stockpiled for reuse in designated area and covered or protected from erosion.
- Construction plans shall indicate how site grading or a drainage system will manage all surface water flows to keep water from entering buildings.
- Permeable paving is utilized for not less than 20 percent of the total parking, walking, or patio surfaces.
- Cool Roof designed and constructed as required by the California Energy Code.
- Buildings must meet or exceeds the requirements of the California Building Energy Efficiency Standards.

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22 Bay Conservation Development Commission. *2011 Living with a Rising Bay: Vulnerability and Adaption in the San Francisco Bay and on its Shoreline*. Available at: http://bcdc.ca.gov/BPA/LivingWithRisingBay.pdf

23 *See ART website: http://www.adaptingtorisingtides.org*

24 2016 California Green Building Standards Code adopted by reference at the Mandatory Level for All Additions and Alterations, and at the Tier One Level for All Wholly New Construction (with the exception of Appendix A4, Division A4.2, Energy Efficiency, and Appendix A5, Division A5.2, Energy Efficiency, both of which are not adopted)

25 Accessed at: http://www.sonoma-county.org/prmd/docs/grnbldg/index.htm

- Plumbing fixtures and fittings (faucets and showerheads) shall comply with specific low flush and low-flow requirements.
- Automatic irrigation systems installed at the time of final inspection, and shall be weather-based or soil based with rain sensors.
- Provide water efficient landscape irrigation design that reduces the use of potable water, so it does not exceed 65% of ETo (reference evapotranspiration) times the landscape area.
- Cement use in foundation mix design is reduced by not less than a 20 percent by incorporating admixture products commonly used to replace cement.
- Post- or pre-consumer recycled content value (RCV) materials with not less than a 10-percent RCV are used on the project.
- Annular spaces or other openings in plates at exterior walls shall be protected against the passage of rodents.
- Recycle and/or salvage for reuse a minimum of 50% of the nonhazardous construction and demolition waste
- At least 65% of nonhazardous construction and demolition debris generated at the site is diverted to recycle or salvage.
- At the time of final inspection, a manual which includes all of the following shall be placed in the building.
- Any installed gas fireplace shall be a direct-vent or sealed- combustion type. Any wood stove or wood heating appliance shall be certified by the United States Environmental Protection Agency and included in the US EPA's published List of EPA Certified Wood Stoves.
- Adhesives, sealants and caulks shall be compliant with VOC and other toxic compound limits, at least 90% of the resilient flooring systems installed in the building shall comply with the VOC-emission limits, and carpet and carpet systems shall meet the testing and product requirements.
- Install thermal insulation in compliance with the VOC-emission limits
- Hardwood plywood, particleboard and medium density fiberboard (MDF) composite wood products used on the interior or exterior of the building shall meet the requirements for formaldehyde.
- Vapor retarder and capillary break is installed at slab-on-grade foundations.
- Building materials with visible signs of water damage shall not be installed. Wall and floor framing shall not be enclosed when the framing members exceed 19% moisture content.
- Fans shall be ENERGY STAR compliant and ducted to terminate outside the buildings.
- Establish HVAC heat loss and heat gain values according to established industry standards.
- Installer training. HVAC system proper installation of HVAC systems.

Impact Analysis

Standards of Significance

In accordance with the California Environmental Quality Act (CEQA), State CEQA Guidelines (including Appendix G), City of Petaluma plans, policies and/or guidelines, and agency and professional standards, the Project's impact would be considered significant if it would:

1. Generate GHG emissions, either directly or indirectly, that may have a significant impact on the environment.
2. Conflict with an applicable plan, policy, or regulation of an agency adopted for the purpose of reducing the emissions of GHGs.

In accordance with State CEQA guidelines, lead agencies must make significance determinations based on substantial evidence in the record for each project. The City has determined that there is substantial evidence to support BAAQMD's analysis as to the levels of GHG emissions that should be deemed significant. Therefore, the City has determined that it will apply the thresholds of significance in the updated BAAQMD CEQA Guidelines. These GHG thresholds include:

- 1,100 metric tons (MT) of Carbon Dioxide equivalent per year (CO2e/yr.), or
- 4.6 MT/year per service population (residents/employees)

Greenhouse Gas Emission Impacts

BAAQMD has determined that GHG emissions and global climate change represent cumulative impacts. No single project could generate enough GHG emissions to noticeably change the global average temperature, but the combination of GHG emissions from past, present, and future projects contribute substantially to the phenomenon of global climate change and its associated environmental impacts. In developing thresholds of significance for GHG emissions, BAAQMD considered the emission levels for which a project's individual emissions would be cumulatively considerable. If a project exceeds the identified significance thresholds, its emissions would be cumulatively considerable, resulting in significant adverse GHG emissions impacts.[26]

Construction Activity Emissions

GHG-1: In the absence of BAAQMD thresholds for construction-related greenhouse gas emissions, emissions from construction have been conservatively compared to the threshold of significance for operation (1,100 MT CO2e/year), and found to generate emissions that fall below that threshold (**Less than Significant**)

Operation of construction equipment would generate greenhouse gas emissions. This includes emissions from construction equipment, truck traffic and associated construction worker traffic. It does not include indirect emissions associated with the manufacturing and transport of building materials.

BAAQMD has not established any thresholds for construction-related greenhouse gas emissions, but requires that projects quantify and disclose such emissions. Greenhouse gas emissions from construction activities for the Project were quantified using the California Emissions Estimator Model (CalEEMod) Version 2016.3.1, as recommended by the BAAQMD (see Appendix 5). The analysis assumes that construction-related emissions would occur over approximately one and one-half years (76 weeks), beginning in 2018 and continuing through the July 2019. The construction phases were assumed to include site preparation (2 weeks), site grading (6 weeks), building construction (60 weeks), paving of streets and sidewalks (4 weeks), and architectural coatings and painting (4 weeks). The total construction-period emissions calculated for these phases of the construction period are estimated at

[26] Bay Area Air Quality Management District, May 2017, *California Environmental Quality Act Air Quality Guidelines*, p. 2-1.

1,317 MT CO_2e. By dividing these total emissions over the 1.5-year construction period, the one-year emission rate is approximately 878 MT CO_2e. These yearly emissions are less than the 1,100 MT CO2e/year threshold of significance used in this EIR, and construction period GHG emissions are less than significant.

Mitigation Measures

None required.

Although construction period GHG emissions are less than significant, BAAQMD nonetheless recommends that all proposed projects implement Best Management Practices to reduce GHG emissions during construction. Measure AQ-4A set forth in Chapter 5 provides for implementation of these BMPs, which would further reduce construction-period GHG emissions.

Project Operational Emissions

GHG-2: The Project would generate greenhouse gas emissions from both direct and indirect sources that would produce total emissions of more than 1,100 metric tons of CO_2e annually, but not more than 4.6 metric tons of CO_2e per service population annually. (**Less than Significant**)

GHG emissions from the Project were estimated using CalEEMod model (version 2016.3.1). Default operation assumptions for Sonoma County for the following land uses were used:

- 278 mid-rise apartment units;
- 445 parking spaces,
- a 3,200 square foot health club, and
- one 400 square foot swimming pool.

Calculations are based on a 2020 operational year. Estimated operational greenhouse gas emissions for the Project are 2,590 metric tonnes CO2e per year (see **Appendix 5**), which exceeds the annual BAAQMD significance threshold of 1,100 MT/year. However, development of the Project site would result in the construction of 278 new residential units. At an average of 2.60 persons per household, new residents at the Project site would account for a service population of approximately 723 people.[27] Dividing the annual GHG emissions by this effective service population results in a service population ratio of approximately 3.58 MT CO_2e per service population per year. This is below the BAAQMD significance threshold of 4.6 MT CO_2e/SP/year, or less than significant.

Policies in the General Plan 2025 may further reduce GHG emissions of the Project, but even without the implementation of additional greenhouse reduction measures, the impact of greenhouse gas emissions from Project operation is considered to be less than significant.

Mitigation Measures

None needed.

[27] 2.60 persons per household based on Census 2010, Fact Sheet, City of Petaluma.

Consistency with GHG Reduction Plans

GHG-3: The Project would not fundamentally conflict with an applicable plan, policy, or regulation adopted for the purposes of reducing greenhouse gas emissions. (**Less than Significant**)

Petaluma has not yet adopted a Climate Action Plan, which would act as a qualified GHG Reduction Strategy. A Climate Action Plan that is intended to fulfill this role is currently being prepared, but is not yet adopted or available. As such, consistency with adopted regulations including AB 32 is used to assess consistency.

The numeric significance thresholds as used in this analysis were formulated based on AB 32 reduction strategies. The numeric GHG significance thresholds are intended to serve as interim levels during the implementation of AB 32 and SB 375. Until AB 32 has been fully implemented in terms of adopted regulations, incentives, and programs, and until the Sustainable Communities Strategy or Alternative Planning Strategy required by SB375 have been adopted or the California Air Resources Board (ARB) adopts a recommended threshold, the City's significance thresholds represent substantial compliance with applicable plans, policies and regulations adopted for the purpose of reducing GHG emissions. Therefore, since the Project would not exceed the numeric service population threshold, the Project would not conflict with applicable plans, policies and regulations adopted for the purpose of reducing GHG emissions.

In general a project is considered consistent with the BAAQMD 2017 CAP if the project supports the primary goals of the CAP and does not interfere with implementation of the 2017 CAP measures. Impacts would be significant if the Project would conflict with or obstruct implementation of the 2017 CAP. Many of the 2017 CAP control measures are targeted to area-wide improvements, large stationary source reductions or large employers, and are not applicable to the Project. The Project would not impede implementation of 2017 CAP control measures, and would have no impact related to an inconsistency with the 2017 CAP.

Furthermore, the Project will be required to comply with all CALGreen + Tier 1 building code requirements per City of Petaluma ordinances, thereby further reducing GHG emissions. Thus, the Project is consistent with applicable GHG Reduction Plans and impacts due to a potential conflict would be less than significant.

Mitigation Measures

None needed.

10

Hazards and Hazardous Materials

The following chapter of this EIR provides an analysis of hazards and hazardous materials impacts resulting from implementation of the Project. Risk could result from demolition, grading, and construction activities or future occupancy and use of the proposed development. The information presented in this chapter of the EIR has been derived from the following primary sources:

- United Soil Engineering, Inc., *Phase I Environmental Site Assessment* for the property, September, 2004 (**Appendix 10**);
- Review of Sonoma County Department of Emergency Services database[1];
- Review of California State Water Resource Control Board's Geotracker database;[2] and
- Review of the California Department of Toxic Substances Control Envirostor database.[3]

Setting

Hazardous Materials, Definition

The California Health and Safety Code defines hazardous materials in broad terms.[4] It states that a hazardous material is any material that, because of its quantity, concentration, or physical or chemical characteristics, poses a significant present or potential hazard to human health and the environment if released into the workplace or the environment. Expanding on this definition, a hazardous material is a substance or combination of substances that, because of its quantity, concentration, or physical, chemical, or infectious characteristics, may either:

- cause or significantly contribute to an increase in mortality or an increase in serious, irreversible, or incapacitating irreversible illness; or
- pose a substantial present or potential hazard to human health and safety, or the environment when improperly treated, stored, transported, or disposed.

Hazardous materials include waste that has been abandoned, discarded, or recycled and as a result would represent a continuing hazard to development. Hazardous materials may also include any contaminated soil or imported fill (i.e., soil placed on the site from another location), should these materials be found to contain hazardous substances.

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1 Accessed at http://www.sonoma-county.org/des, on 10/16/14 and 9/20/17

2 Accessed at http://geotracker.swrcb.ca.gov/, on 10/16/14, 8/31/15 and 9/20/17

3 Accessed at http://www.envirostor.dtsc.ca.gov/public/search, on 10/16/14, 8/31/15 and 9/20/17

4 *California Health and Safety Code*, http://www.leginfo.ca.gov/calaw.html

Project Site Conditions

A history of the Project site was documented in a Phase I Environmental Site Assessment (ESA) prepared by United Soil Engineering, Inc. (2004).[5] The earliest available aerial photograph of the site is from 1957, showing several small farming buildings, consistent with the site's history as a dairy farm. This aerial view remained the same until the photo from 1993, showing that the farming buildings had been removed. The current conditions consist of the existing Oak Creek Village apartments, with the balance of the project site being vacant. While there are no buildings on the developable portion of the site, there are two wells, which will be abandoned as part of the proposed development.

Phase I Investigation

The Phase I ESA report on the property and surrounding area (dated January 2004) includes a literature review, records review, site reconnaissance, and interviews with knowledgeable parties. The Phase I ESA found that:

- the property was not listed on any environmental database as a hazardous materials site,
- there were no indications of any hazardous substance releases associated with the property;
- there was no evidence or indication of any hazardous substance containers in connection with the site identified during the course of the Phase I ESA;
- there was no evidence or indication of polychlorinated bi-phenols (PCBs) in connection with the subject site;
- there was no evidence or indication of solid waste disposal in connection with the site; and
- there were no indications or records of environmental liens in connection with the site in response to the American Society for Testing Materials (ASTM) ESA Transaction Screen Questionnaire.

There have been no activities on the Project site since preparation of the 2004 Phase I ESA that would suggest a need to update or re-validate this information for current conditions. Furthermore, Geotracker and Envirostor databases were reviewed in 2014, August of 2015 and again on September 20, 2017 to determine if any recent releases have occurred onsite or in the project vicinity. Based on review of those databases no new spills or releases not otherwise identified in this EIR have occurred. Thus, site conditions are presumed to be similar to conditions evaluated in the detailed 2004 ESA.

Potential Effects from Off-Site Locations

Phase I Investigation

The Phase I ESA also included an investigation of neighboring and nearby sites, including searches of databases containing information on surrounding underground storage tanks and leaking underground storage tanks. The search revealed four (4) sites with open environmental cases, primarily due to diesel and gasoline from leaking underground storage tanks (LUST), located west and southwest of the Project site. [6]

[5] United Soil Engineering, Inc., *Phase I Environmental Site Assessment*, September, 2004

[6] Ibid

Only two (2) of these cases remain open, and one new case has opened since the 2004 report. These two remaining cases and one new open case, and the nature of these cases, are discussed and updated as applicable, below.

1300 Petaluma Boulevard North

Cal West Rentals is located at 1300 Petaluma Boulevard North, approximately 1,000 feet due west of the Project site. A gasoline tank leak was discovered in 1987 at this site when two underground storage tanks were being removed. The leak affected soils and the shallow groundwater aquifer. Site investigation began in 1991, and in 1992, three additional USTs were removed from the site and the area was over-excavated. A skimmer device was installed in 1996.

A Feasibility Study/Corrective Action Plan (FS/CAP) for this site was submitted in 2004, along with a 2008 Addendum. As recently as February 2014, the Sonoma County Department of Health Services issued a general concurrence with the proposed Remedial Action Plan for this site, which includes a dual-phase extraction and soil vapor extraction process for remediation of on-site soils and groundwater. A June 2015 Pathway to Closure Plan indicates that this site is not yet ready for closure as a low threat to public and environmental health, but that if all monitoring, investigations and remedial efforts were to be completed, closure may be anticipated to occur in 2018. The current status of this site remains in "Open-Remediation".[7] There is no indication that contamination from this site has affected the Project site.

900 Petaluma Boulevard North

The Shell-Favorite Car Wash is located at 900 North Petaluma Boulevard, about 900 feet southwest of the Project site at the intersection of Petaluma Boulevard/Payran Street. An underground storage tank was discovered as leaking gasoline, and a work plan for remediation by excavation and treatment of the affected soil was completed in 1991.

Site investigation has been ongoing until 2007, when a Feasibility Study/Corrective Action Plan was submitted. In September of 2014, a Case Closure Request was submitted on behalf of Shell Oil Products, US (the owner) requesting that the Sonoma County Department of Health Services consider this site closed based on the State's Low Threat Closure policy. The request indicated that the unauthorized release at the site consists only of petroleum, the suspected release sources were removed during 1986 and 1998 UST system upgrades, and that free product has not been observed in any of the monitoring wells. Based on an August 5, 2015 letter from the Sonoma County Department of Health Services, it does not appear that further monitoring, investigation or remedial actions are necessary at this site to protect the beneficial uses of the waters of the State of California, and the County has requested the RWQCB concur with a Case Closure Summary. On April 29, 2016 the cleanup was completed and the case was closed.[8]

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[7] Accessed at the RWQCB Geotracker website, https://geotracker.waterboards.ca.gov/regulators/deliverable_documents/5657895743/1300%20Petaluma%20Blvd.N.%20Concurrence%20with%20RRAP.pdf on 8/31/15

[8] Accessed at: https://geotracker.waterboards.ca.gov/profile_report.asp?global_id=T0609700919, on June 2017.

1478 Petaluma Boulevard North

Based on a May 2015 letter from the RWQCB, groundwater and soil vapor contamination consisting of tetrachloroethene (PCE) has been discovered at this site. The contamination threatens to adversely affect the beneficial uses of groundwater, including domestic and agricultural water supply. This contamination threatens to cause a condition of pollution in waters of the State, and the RWQCB has indicated that this condition must be fully delineated and abated in the shortest reasonable time. Water Board staff estimate the following work will need to be performed at the site in the near term: 1) review work plans, investigation reports, remediation plans, monitoring reports and associated correspondence; 2) if necessary, conduct site inspections and duplicate samplings; and 3) identify issues relevant to site cleanup. These efforts will enable Water Board staff to determine whether additional investigations and possibly remedial action is warranted for this site. Currently the site status is "Open - Assessment & Interim Remedial Action needed, as of 5/22/2015.[9]

Other Data Base Records

Government Code Section 65962.5(a)(1) requires that the Department of Toxic Substances Control (DTSC) maintain a list of hazardous waste and substances sites. The DTSC's EnviroStor database provides information on sites with known contamination, or that have reason to be investigated further. Sites are also shown that are authorized to treat, store, dispose or transfer hazardous waste. There are no known cleanup sites on the Project site or any other sites in the immediate Project vicinity beyond those identified above pursuant to the EnviroStor database, accessed as of September 2017.

Additionally, the State Water Resources Control Board maintains the GeoTracker database, a data management system for sites that require groundwater clean-up as well as permitted facilities such as underground storage tanks and disposal site. There are no identified leaking underground storage tanks (UST), permitted UST, nor are there cleanup or disposal sites on the Project site or any other sites in the immediate Project vicinity beyond those identified above pursuant to the GeoTracker database accessed September 2017.

With the exception of the three cases at 900, 1300 and 1478 Petaluma Boulevard North as described above, all other environmental cases within approximately ¾ mile of the Project site have received a Case Closure report and are no longer active or pose a threat to human or environmental health.

The Phase 1 ESA concluded that the site has not been adversely impacted by on-site environmental releases of hazardous material, but that testing of surface soils at the Project site for pesticides was recommended prior to development because of former agriculture use.

The Phase I ESA, as supplemented by current regulatory database investigations, also concluded that there are no recognizable environmental conditions identified from historical research and environmental databases performed for the Project site and the vicinity, that would indicate the Project site has been adversely impacted by off-site cases.

[9] Accessed at : https://geotracker.waterboards.ca.gov/profile_report.asp?global_id=T10000006992 on 6/26/17

Regulatory Setting

Federal Regulations

The U.S. Environmental Protection Agency (EPA) is responsible for enforcement and implementation of federal laws and regulations pertaining to hazardous materials. The federal regulations that govern hazardous materials are codified primarily in Title 40 of the Federal Code of Regulations. The primary legislation includes the Resource Conservation and Recovery Act of 1976 (RCRA) and the Comprehensive Environmental Response, Compensation and Liability Act of 1980 (CERCLA), as amended by the Superfund Amendments and Reauthorization Act (SARA) and the Emergency Planning and Community Right-to-Know (SARA Title III). These laws and associated regulations include specific requirements for facilities that generate, use, store, treat, transport, and/or dispose of hazardous materials. The chief environmental regulator at the federal level is the United States Environmental Protection Agency (EPA), Region IX for Northern California.

State Regulations

California EPA - Department of Toxic Substance Control

In California, the Department of Toxic Substance Control (DTSC) is authorized by the U.S. EPA and Cal/EPA to enforce and implement federal hazardous waste laws and regulations. Requirements place "cradle-to-grave" responsibility for hazardous waste disposal on the shoulders of hazardous waste generators. Generators of hazardous waste must ensure that their wastes are disposed of properly, and legal requirements dictate the disposal requirements for many waste streams (e.g., banning many types of hazardous wastes from landfills).

California regulations pertaining to hazardous materials equal or exceed federal regulations. In January 1996, Cal/EPA adopted regulations implementing a Unified Hazardous Waste and Hazardous Materials Management Regulatory Program governing (1) hazardous waste generators and hazardous waste onsite treatment, (2) underground storage, (3) above-ground storage tanks, (4) hazardous materials release response plans and inventories, (5) risk management and prevention programs, and (6) Unified Fire Code hazardous materials management plans and inventories. The program is implemented at the local level by a designated local agency—the Certified Unified Program Agency (CUPA). The CUPA is responsible for consolidating the administration of the six program elements within its jurisdiction.

State and federal laws require detailed planning to ensure that hazardous materials are properly handled, used, stored, and disposed of, and in the event that such materials are accidentally released, to prevent or to mitigate injury to health or the environment. California's Hazardous Materials Release Response Plans and Inventory Law, sometimes called the "Business Plan Act," aims to minimize the potential for accidents involving hazardous materials and to facilitate an appropriate response to possible hazardous materials emergencies. The law requires businesses that use hazardous materials to provide inventories of those materials to designated emergency response agencies, to illustrate on a diagram where the materials are stored on site, to prepare an emergency response plan, and to train employees to use the materials safely.

Regional Water Quality Control Board

Along with DTSC, the Regional Water Quality Control Board (RWQCB), which operates under the jurisdiction of Cal/EPA, is responsible for implementing regulations pertaining to management of soil

and groundwater investigations and cleanup. RWQCB regulations applicable to hazardous materials are contained in Title 27 of the California Code of Regulations (CCR).

The RWQCB has established "Environmental Screening Levels" (ESLs) for chemicals commonly found in soil and groundwater sites where releases of hazardous chemicals have occurred. ESLs provide conservative screening levels for over 100 chemicals commonly found at sites with contaminated soil and groundwater. They are intended to help expedite the identification and evaluation of potential environmental concerns. Additional evaluation generally is necessary where a chemical is present at concentrations above the corresponding ESL. The ESLs were first established in 2008 and updated in December 2013. The ESLs were developed to address the environmental protection goals presented in the Water Quality Plan for the San Francisco Bay Basin (Basin Plan), including protection of human health (direct-exposure); protection of drinking water resources; protection of aquatic and terrestrial habitats; protection against vapor intrusion into buildings; and protection against adverse nuisance conditions.

Additional state regulations applicable to hazardous materials are contained in Title 22 of the CCR. Title 26 of the CCR is a compilation of those sections or titles of the CCR that are applicable to hazardous materials.

California Department of Transportation

Transportation of hazardous materials and wastes is regulated by Title 26 of the CCR. The California Department of Transportation (Caltrans) is the primary regulatory authority for the interstate transport of hazardous materials and establishes safe handling procedures for packaging, marking, labeling, routing, etc. The California Highway Patrol and Caltrans enforce federal and State regulations and respond to hazardous materials transportation emergencies. A "Uniform Hazardous Waste Manifest" is required by DTSC and must accompany most hazardous waste before transporting any waste off site. The manifest travels with the hazardous waste from the point of generation, through transportation, to the final treatment, storage and disposal facility. If a discharge or spill of hazardous waste occurs during transportation, the transporter is required to take appropriate immediate action to protect human health and the environment (i.e., notify local authorities, dike the discharge area), and shall be responsible for the discharge/cleanup, pursuant to Title 22 of the California Code of Regulations, Sections 66263.30 and 66263.31.

Local Regulations

Sonoma County

Hazardous materials and contaminants in the environment are locally regulated through the Sonoma County Environmental Health Division (SMCEHD) or the Sonoma County Department of Emergency Services (DES). These agencies work in conjunction with the Sonoma County Permit and Resource Management Department (PRMD) to establish compliance with laws regulating the storage, use, and disposal of hazardous materials. First responders to hazardous material emergencies for the area could include the Petaluma Fire Department, with a station at 198 D Street. Hazardous material specialists such as the Sonoma County Hazardous Materials Response Team may also respond. State law requires that first responders have a minimum of 40 hours of training in accordance with the Occupational Safety and Health Administration (OSHA) Hazardous Waste Operations and Emergency Response (HAZWOPER) standard.

The Sonoma County Environmental Health Division administers the local oversight program, the Septic Tank/Chemical Toilet Waste Pumping & Disposal Program, and the Stormwater Management Program.

The Sonoma County Local Oversight Program (LOP) oversees the investigation and cleanup of fuel releases from underground storage tanks in all areas of the county with the exception of the cities of Santa Rosa and Healdsburg. Sites are entered into the LOP when a release from an underground tank is reported. The Septic Tank/Chemical Toilet Waste Pumping & Disposal Program provides for the permitting, monitoring, and surveillance of septic tanks, chemical toilets, and vaults, as well as abandonment and disposal of septic waste within Sonoma County. The Stormwater Management Program is designed to reduce urban runoff from polluting local waterways through use of best management practices, monitoring and other techniques. The Sonoma County Environmental Health Division is also charged with administering the State of California's Medical Waste Program. Regulation of potentially hazardous pesticides and herbicides is under the jurisdiction of the Sonoma County Agricultural Commissioner.

Hazardous waste management in Petaluma is administered by the Sonoma County Waste Management Agency (SCWMA) through the Countywide Integrated Waste Management Plan (CoIWMP), which as required by State law, includes the Source Reduction and Recycling Element (SRRE), Household Hazardous Waste Element (HHWE), Non-Disposal Facility Element (NDFE), as well as the Siting Element.

Consolidated Unified Protection Agency

As indicated above, State law also requires that communities form a Consolidated Unified Protection Agency (CUPA) to manage the acquisition, maintenance, and control of hazardous waste by industrial and commercial business. Within the Department of Emergency Services (DES), the Hazardous Materials (HazMat) Division is responsible for Sonoma County's Certified Unified Program Agency (CUPA). CUPA programs are the Hazardous Materials Business Plan Program, Hazardous Waste Program, Underground Tank Program, Accidental Release Program, and the portions of the Uniform Fire Code that address hazardous materials. This program includes inspections of businesses and review of permit conditions and procedures for the handling, storage, use and disposal of hazardous materials. The Hazardous Materials Business Plan is used to keep track of the use of hazardous materials by businesses in accordance with both state and federal laws. The Hazardous Waste Generator Program is based on the Hazardous Waste Control Law found in the California Health and Safety Code Division 20, Chapter 6.5 and regulations found in the California Code of Regulations, Title 22 Division 4.5.

City of Petaluma

In Petaluma, the Fire Marshal's Office administers the CUPA programs. As the CUPA, the Fire Department regulates all aspects of hazardous materials storage, use, and waste disposal (City of Petaluma, October 2014).

General Plan

The Petaluma General Plan 2025 Health and Safety Element includes the following polices relating to hazardous materials:

> **10-P-4:** Minimize the risk to life and property from the production, use, storage, and transportation of hazardous materials and waste by complying with all applicable State and local regulations.
>
> a. Require compliance with Sonoma's Countywide Integrated Waste Management Plan (CoIWMP) as well as all of the Consolidated Unified Protection Agency (CUPA) program elements.
>
> b. Prepare and maintain an inventory of environmentally contaminated sites to educate future landowners about contamination from previous uses. Work directly with landowners in the cleanup of these sites, particularly in areas with redevelopment potential.

c. Establish special zoning designations and environmental review processes that limit the location of industry, research, and business facilities using hazardous materials. Require safe distances between these sites and residential areas, groundwater recharge areas, and waterways.

Municipal Code Requirements

Certified Unified Program Agency

Chapter 17.21 of the Municipal Code provides for the Petaluma Fire Department to implement all hazardous materials and hazardous waste programs covered under Health and Safety Code Section 25404, et seq., "Unified Hazardous Waste and Hazardous Material Management Regulatory Program." The Petaluma Fire Department enforces the Hazardous Materials Management Plan requirements of the Uniform Fire Code, and Health and Safety Code programs for Hazardous Materials Business Plan and the Risk Management and Prevention Plan. New programs in the Health and Safety Code to be undertaken by the Fire Department include Hazardous Waste Generator, On-Site Treatment of Hazardous Waste (authorized lower three tiers of the Tiered Permitting program), Underground Storage Tank, and Aboveground Storage Tank—Spill Prevention, Control and Countermeasure Plan. The purpose of these CUPA regulations is to bring all hazardous material and hazardous waste regulatory authority and compliance requirements within one ordinance.

> **17.21.040 Certified Unified Program Agency permit required**. Any person intending to do or perform any of the following activities shall first apply for, pay appropriate fees to and obtain a permit from the CUPA, unless otherwise exempted by a provision of law or regulation listed in Section 17.21.010C or by Section 17.21.060D:

California Fire Code

The City of Petaluma has adopted the California Building Standards Code, Title 24, Part 9, (or the 2013 California Fire Code), incorporating the 2012 Edition of the International Fire Code. The provisions of the Fire Code prescribe regulations governing conditions hazardous to life and property from fire, hazardous materials or explosions. Provisions of the Fire Code relevant to the proposed Project include:

> **D103.3—Turning Radius**. The minimum turning radius shall be determined by the Fire Code Official or as approved by local standards.
>
> **D103.4—Dead Ends**. Dead-end fire apparatus access roads in excess of one hundred fifty feet (150') (45.720 m) shall be provided with width and turnaround provisions in accordance with the local agency requirements for public streets or as approved by local standards.
>
> **D106.1—Projects Having More Than Fifty (50) Dwelling Units**. Multiple-family residential projects having more than fifty (50) dwelling units shall be provided with two (2) separate and approved fire apparatus access roads.

Swimming Pool Regulations

> **17.24.010 Fencing required**. Every person in possession of land within the city upon which is situated a swimming pool or other outdoor body of water designed, constructed and used for swimming, dipping or immersion purposes, and having a depth in excess of two feet, shall at all times maintain on the lot or premises upon which such pool or body of water is located, and completely surrounding such pool, body of water or premises, a fence or wall not less than six feet in height so that the swimming pool or body of water is completely enclosed by such fence or wall, or is enclosed in part by such fence or wall, and in part by a dwelling house or other permanent structure to which such fence or wall is connected.
>
> a. Such fence or wall shall be constructed so as to prevent any person, including small children, from crawling or passing through, under or over the same except at gates therein.

b. The construction of the fencing or wall shall be of material approved by the city building inspector.

Impact Analysis

Standards of Significance

In accordance with the California Environmental Quality Act (CEQA), State CEQA Guidelines (including Appendix G), City of Petaluma plans, policies and/or guidelines, and agency and professional standards, the Project's impact would be considered significant if it would:

1. Be located on a site which is included on a list of hazardous materials sites compiled pursuant to Government Code Section 65962.5 and, as a result, would it create a significant hazard to the public or the environment;
2. Create a significant hazard to the public or the environment through the routine transport, use, or disposal of hazardous materials;
3. Create a significant hazard to the public or the environment through reasonably foreseeable upset and accident conditions involving the release of hazardous materials into the environment;
4. Produce hazardous emissions or handle hazardous or acutely hazardous materials, substances, or waste within one-quarter mile of an existing or proposed school;
5. Be located within an airport land use plan or, where such a plan has not been adopted, within two miles of a public airport or a public use airport, or within the vicinity of a private airstrip, such that development would result in a safety hazard for people residing or working in the Project Area;
6. Impair implementation of or physically interfere with an adopted emergency response plan or emergency evacuation plan; or
7. Expose people or structures to a significant risk of loss, injury or death involving wildland fires, including where wildlands are adjacent to urbanized areas or where residences are intermixed with wildlands.

The Project site is located within the urban boundaries of the City of Petaluma, surrounded mainly by agricultural activities and does not abut wildlands. The most common types of fire are structural or urban fires. The threat of wildland fires associated with this Project is less than significant, and not discussed further in this EIR.

The nearest airport to the Project site is the Petaluma Municipal Airport, located 2 miles to the east. The Project site is not included within the Airport Land Use Plan, and its impact on airport operations is less than significant and not discussed further in this EIR.

Registered Hazardous Materials Sites

Haz-1: The Project site is not located on a site that is included on a list of hazardous materials sites compiled pursuant to Government Code Section 65962.5, and development of the Project at this site would not create a significant hazard to the public or the environment. (**Less than Significant with Mitigation**)

The Project site is not included on a list of hazardous materials sites compiled pursuant to Government Code Section 65962.5, including the DTSC's EnviroStor database and the SWRCB's GeoTracker database.

The Phase 1 ESA prepared in conformance with the scope and limitations of ASTM Practice E 1 527 for the Project site revealed that the site has not been adversely impacted by any environmental releases, either off-site or on-site. However, the Phase I report did recommend that the surface soil at the site be tested for pesticides prior to development because of the former agriculture use. [10]

Mitigation Measures

Mitigation Measure Haz-1: Soil Testing and Regulatory Compliance. Prior to issuance of building or grading permits, the project applicant shall conduct a soil testing program to identify the potential for agricultural chemicals to be present in the soils at levels exceeding recommended health screening levels. Should any pesticide-impacted soil be discovered that exceeds California Human Health Screening Levels (CHHSLs) and/or Environmental Screening Levels (ESLs), such soils shall be excavated and removed for appropriate off-site disposal prior to development pursuant to existing regulatory requirements.

Resulting Level of Significance

With implementation of Mitigation Measure Haz-1 and compliance with all applicable regulatory requirements regarding California Human Health Screening Levels for residual pesticides, the impacts of the Project regarding hazardous materials exposure will be reduced to a level of less than significant.

Routine Transport, Use or Disposal of Hazardous Materials

Haz-2: Construction activities require the use of fuels and oils in construction equipment that may be considered hazardous if improperly used, stored or handled. Residential developments generally utilize only incidental amounts of household hazardous chemicals. Compliance with applicable regulations will ensure that construction and operation of the Project will not create a significant hazard to the public or the environment through the routine transport, use, or disposal of potentially hazardous materials. (**Less than Significant**)

Project construction activities include site grading, trenching for the installation of underground utilities, street paving and construction of new residential structures and a clubhouse facility. It is likely that equipment used during construction activities will utilize substances considered by regulatory bodies as hazardous. These substances likely include diesel fuel, gasoline, lubricating oil, hydraulic oil, lubricating grease, automatic transmission fluid, paints, solvents, glues, and other substances. Construction of the Project would also require the use of gasoline and diesel-powered heavy equipment, such as bulldozers, backhoes, water pumps and air compressors.

Residential uses generally do not utilize substantial amounts of hazardous materials other than incidental use of household chemicals and vehicle fuels. The Project's proposed swimming pool will also likely utilize chemicals such as chlorine as a disinfectant.

Routine use of materials considered hazardous during the construction period, routine use of chlorine at the clubhouse pool, and incidental use of household hazardous chemicals would be required to comply with applicable regulations regarding the handling of these materials. Compliance with applicable regulatory requirements would minimize hazards to workers, the public, and the environment from use

[10] United Soil Engineering, Inc., 2004, page 7

of these potentially hazardous products. Accordingly, the impact of the Project related to routine transport, use and disposal of hazardous materials due to construction and operation of the proposed Sid Commons Apartments would be less than significant.

Mitigation Measures

None needed.

Accidental Release of Hazardous Materials

Haz-3: The Project could create a significant hazard to the public or the environment through reasonably foreseeable upset and accident conditions involving the release of hazardous materials into the environment. **(Less than Significant with Mitigation)**

The potential for an accidental release of hazardous materials into the environment is considered most likely during the construction phase, when concrete, wood preservatives, paint, asphalt, and other potentially hazardous materials would be stored, used, and moved around on the Project site and in close proximity to the Petaluma River, and when construction equipment is fueled and maintained. The risk is that a leak or spill could seep into the ground or waterways and into the River, harming the aquatic environment. A separate risk could occur from the threat of a spill or leak during routine use of household hazardous materials and chlorine at the pool.

Due to proximity to sensitive riparian habitat and the Petaluma River, any potential spill of these hazardous materials could become hazardous to the environment and quickly spread downstream.

Mitigation Measures and Regulatory Compliance

Construction contractors will be required to comply with all existing federal and state safety regulations related to the transport, use, handling, storage, and/or disposal of fuels or other potentially hazardous substances during all phases of construction. Should any construction activities occur that involve the storage of chemicals or hazardous materials onsite, the applicant must file a declaration form with the Fire Marshal's office and shall obtain a hazardous materials storage permit, pursuant to the City Fire Code ordinance. These existing regulations would also require the contractor to be responsible for reporting spills or leaks of hazardous materials, and for cleanup of any such spill under the supervision of the County and licensed hazardous materials contractors, as applicable.

As discussed in Chapter 11: Hydrology and Water Quality of this EIR, the provisions of the federal Clean Water Act as implemented by the RWQCB require construction activity on projects that disturb one or more acres of soil to obtain coverage under the General Permit for Discharges of Storm Water Associated with Construction Activity (Construction General Permit, 99-08-DWQ). As a condition of Project approval and prior to start of grading or other construction activities, the Project applicant will be required to file a Notice of Intent (NOI) with the RWQCB for compliance with the General Construction Permit.

As also described in the Hydrology and Water Quality chapter of this EIR, the Project applicant shall prepare a Storm Water Pollution Prevention Plan (SWPPP) for implementation throughout the Project's construction phases to control erosion on the Project site and to provide guidelines for the storage, use and clean-up of fuels and hazardous materials. The SWPPP shall identify stormwater collection and discharge points, drainage patterns across the site and best management practices (BMPs) that the discharger will use to protect stormwater runoff and the placement of those BMPs, including BMPs related to hazardous materials used during construction. Final development plans for the Project shall

include a Storm Water Pollution Prevention Plan (SWPPP) that provides plans and detailed calculations that show how the requirements for post-construction runoff treatment have been met in accordance with the City's stormwater management regulations, including BMP treatment measures for post-construction runoff so that water quality is protected. Such BMPs shall include but are not limited to preparation of a stormwater protection brochure for new residents providing information on safe disposal and cleanup including proper disposal of household and commercial chemicals; proper use of landscaping chemicals; clean-up and appropriate disposal of landscape materials and waste; and prohibition of any washing and dumping of materials and chemicals into storm drains. Informational literature may be borrowed from the Sonoma County Waste Agency, including that found online at http://www.recyclenow.org/. Post-construction BMPs shall also be identified in the SWPPP pursuant to RWQCB requirements.

Mitigation Measures

Specific design requirements and implementation measures for minimizing Project-generated erosion and for controlling fuel/hazardous material spills to be set forth in the applicant's SWPPP are identified in the following mitigation measure) see Chapter 11: Hydrology):

- **Mitigation Measure Hydro-1: SWPPP Requirements**.

Resulting Level of Significance

Required compliance with all federal state and local regulations regarding use, handling and storage of hazardous materials will minimize the risk of accidental upset or spill. Implementation of Project-specific details of the SWPPP pursuant to MM Hydro-1: SWPPP Requirements will reduce the potential for accidental spills of hazardous materials to enter the waterway, and the impact will be reduced to a less than significant level. No further mitigation measures are required.

Hazardous Emissions within One-Quarter Mile of a School

Haz-4: The Project will not produce hazardous emissions or handle hazardous or acutely hazardous materials, substances or waste that could impact an existing or proposed school. (**Less than Significant**)

The Project site is located one-half mile northwest of the nearest school, McKinley Elementary School. The types of hazardous materials associated with the Project at operation would be limited to typical household chemicals such as cleaners, fertilizers and swimming pool disinfectants. There are no planned industrial uses or other anticipated stationary sources of pollution, toxic air contaminants or hazardous materials that could cause off-site hazardous emissions. As described above, measures that prevent spills and provide that corrective actions be taken in the event of a spill ensure that construction related hazardous materials do not pose a threat. Therefore, the Project would have a less than significant impact to schools located within ¼ mile due to the release of hazardous materials.

Mitigation Measures

None needed.

Hazardous Conditions - Increased Presence along Rail Tracks

Haz-5: The Project would result in increased hazards associated with increased presence along the rail racks. (**Less than Significant with Mitigation Measures**)

The Project site's entire westerly boundary is parallel and immediately adjacent to the SMART railroad right-of-way. The increased presence of residents and visitors in an area immediately adjacent to the rail tracks will result in a greater potential for rail-related accidents along this portion of the line.

The Project does not propose a fence along the rail line.

Mitigation Measures

The following mitigation measure, as derived from the CPUC response to the City's NOP, would be required to address the safety hazard associated with increased presence along the rail tracks:

Mitigation Measure Haz-5: Fencing. The Project shall include appropriate mobility barrier fencing along the edge of and parallel to the rail tracks to limit access onto the railroad right-of-way. This fencing shall be subject to Site Plan and Architectural Review and approval, shall be designed with consideration of trees near the property line, and may be visually open.

Resulting Level of Significance

Construction of appropriate fencing along the Project's frontage to the rail tracks would reduce safety hazards associated with access onto the railroad right-of-way to a level of less than significant.

Hazardous Conditions – Rail Crossing

Haz-6: The Project would result in increased hazards associated with at-grade rail crossings, including traffic, bicycle and pedestrian crossings at a potentially unsafe location, and increased presence along the rail racks. (**Significant and Unavoidable**)

The Project proposes to provide primary access to the site at buildout via an extension of Shasta Avenue. The Shasta Avenue extension would increase circulation options and provide a more direct connection to and from the Project site to emergency service locations to the west of the rail tracks. However, the Project's proposed extension of Shasta Avenue as the primary means of access to the site will also create a new at-grade crossing of the SMART railroad right-of-way. The presence of additional traffic, bicycles and pedestrians at this crossing represents a safety hazard for new residents, for others who may choose to drive across the new at-grade crossing, and for railroad operations due to the increased possibility of train collisions and train-related accidents.

Any project that includes modifications to an existing rail crossing or proposes a new rail crossing is legally required to obtain authority to construct from the California Public Utilities Commission (CPUC). As part of its mission to reduce hazards associated with at-grade rail crossings and in support of the national goals of the Federal Railroad Administration, the CPUC's policy is to reduce the number of at-grade crossings on freight and passenger mainlines in California. In their letter responding to the City's NOP for this EIR (August 8, 2007), CPUC staff indicated that the Shasta Avenue crossing was abolished in 1961 as part of an agreement to open the Payran Street crossing and that they cannot support a new at-grade crossing at Shasta Avenue. Given the CPUC's legal jurisdiction over rail crossings and their lack of support for the proposed Shasta Avenue extension (or any new at-grade rail crossings) because such

crossings represent a significant collision-related safety hazard, the City of Petaluma also concludes that the Shasta Avenue extension, as an at-grade rail crossing, represents a significant safety hazard impact.

Mitigation Measures

The following mitigation measure, as derived from the CPUC response to the City's NOP, would be required to address the safety hazard associated with an at-grade crossing:

Mitigation Measure Haz-6: Grade Separation. Any access to the Project site proposed as an extension of Shasta Avenue shall include plans for a grade-separated crossing of the rail tracks.

a) Any proposal for a grade-separated crossing of the rail tracks at Shasta Avenue shall be accompanied by detailed design plans, which shall be subject to subsequent or supplemental review by the City, as well as approval by the CPUC, prior to construction.

b) Any plans submitted to the City of Petaluma for such a grade-separated crossing must be accompanied by a Fire Protection Engineer Report, per the requirements of the City of Petaluma Fire Department.

Resulting Level of Significance

The construction of a grade separated crossing of the rail tracks at the Shasta Avenue extension would avoid the safety impacts associated with an at-grade crossing and would minimize safety concerns along the tracks. No grade separated structure has been designed or proposed by the Project applicant, and the feasibility of constructing a grade separated crossing is substantially limited by other existing property ownerships on the west side of the tracks, and limited space to accommodate a structure with adequate height and turning radius into the site on the east (Project) side of the tracks. Construction of a grade separated structure with a design that could be supported by the CPUC and the City of Petaluma may not be feasible. As such, this impact is considered a significant and unavoidable impact of the Project as proposed.

Emergency Access

Haz-7: The Project provides adequate emergency access to the future residential development site, but the access limitations of the site result in significant secondary effects at buildout. (**Less than Significant)**

Primary access to the Project site would be solely from Graylawn Avenue, unless the proposed Shasta Avenue Extension to Graylawn is authorized by the CPUC (as a new at-grade crossing of the railway). According to the Petaluma Fire Code, section D106.1, "multiple-family residential projects having more than fifty (50) dwelling units shall be provided with two (2) separate and approved fire apparatus access roads." Without construction of the proposed Shasta Avenue Extension, construction activity and operation of the Project would be under-served by fire apparatus roadways, resulting in a significant emergency access impact. Therefore, the Project proposes to provide a secondary means of access to the site via a public access easement at the existing approximately 32-foot wide Project frontage located at the end of Bernice Court. The Bernice Court connection is intended as an emergency vehicle access (EVA) only, and not as a through street, and is designed to meet all fire apparatus, turning radius and turnaround requirements of the Petaluma Fire Code. The Petaluma Fire Department has reviewed this proposed EVA route and found it to provide acceptable emergency access to the site.

Access to the Project site is proposed to include both Graylawn Avenue and the extension of Shasta Avenue across the rail tracks, along with the proposed secondary EVA at Bernice Court. However, as further discussed under Impact Haz-6 above, construction of the Shasta Avenue extension as an at-grade crossing of the rail tracks presents a significant and unavoidable safety hazard related to potentially increased vehicle, bicycle and pedestrian collisions at the rail crossing. As such, the proposed Shasta Avenue extension as an at-grade extension may prove to be infeasible (i.e., may not receive approval of the CPUC). Additionally, the Petaluma Fire Department finds that site access via an at-grade rail crossing has a higher likelihood of blocking emergency vehicle access than does a typical street.

Without the Shasta Avenue extension, access to the Project site at buildout would be limited to Graylawn Avenue and the Bernice Court EVA. The Petaluma City Engineer and Fire Marshall reviewed the proposed Bernice Court EVA route and found that, even with Graylawn as the only primary access route, the Bernice Court EVA provides acceptable emergency vehicle access to serve the Project even under buildout conditions, but also indicated that two points of public roadway connections would be preferable.[11]

Emergency access via Graylawn Avenue and the secondary EVA at Bernice Court would provide adequate emergency access, would not conflict with the provisions of the 1982 PUD restrictions on Graylawn traffic, and would have less than significant impacts related to emergency access.

Mitigation Measures

None needed.

Secondary Issues

Pursuant to the existing Oak Creek Apartments PUD, use of Graylawn Avenue as a primary point of access to the Project site is restricted to uses permitted in the City's Agriculture zoning district (see further discussion under Chapter 5: Land Use, Chapter 12: Transportation, and Chapter 14: Alternatives). Without approval of the Project's proposed PUD Amendment, use of Graylawn as the primary means of access to the Project site would be limited only to existing APN-006, which was not a part of the 1982 Oak Creek Apartment PUD and not subject to its restrictions on access. Furthermore, allowing primary access for buildout of the Project from Graylawn Avenue only will result in traffic levels on Graylawn exceeding the City of Petaluma's "livable street standards" by introducing more vehicle trips per day than the City residential street standard allows.

Unless and until a secondary means of primary access to the Project site is approved by the City (and by the CPUC, assuming the second means of access remains the Shasta Avenue extension across the rail tracks), any amount of development on APN-009 that would exceed the single dwelling unit permissible under the City's Agricultural zoning district would conflict with the provisions of the 1982 PUD, and would rely on approval of a PUD Amendment striking existing language that all major Project accesses be from new public street(s) rather than from Graylawn Avenue.

[11] Personal communication between Tiffany Robbe (City Planner), City Engineer and Fire Marshall, October 2014