11

Hydrology and Water Quality

This chapter provides information on hydrologic resources in the Project Area, including a presentation of federal, state, and local laws, policies, and regulations that influence protection of hydrology resources and water quality. The chapter identifies impacts on hydrological resources that may result from site grading and construction, include on- and off-site flooding potential and water quality effects. 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:

- Petaluma General Plan 2025;
- Review of existing City of Petaluma ordinances;
- City of Petaluma *River Access and Enhancement Plan*;
- Detailed hydraulic modeling completed by West Consultants (WEST). WEST was retained to utilize the City's XP-SWMM model (version May 2010) to examine the potential floodplain impacts of the Project, as well as cumulative effects of various floodplain management scenarios. The results of this modeling are presented in the WEST Hydrology memos dated December 22, 2016 and February 22, 2017 (attached as **Appendix 11A and 11B**);
- *Storm Water Control Plan for a Regulated Project: Sid Commons*, CSW/Stuber-Stroeh Engineering Group, Inc., July 21, 2015 (attached as **Appendix 11C**) and Preliminary Storm Water Control Plan (Sheet C-7) prepared by CSW/Stuber-Stroeh Engineering Group, Inc., May 1, 2017;
- FEMA Flood Insurance Rate Maps, which became effective February 19, 2014; and
- FEMA Bay Coastal Study Remapping of Flood Insurance Rate Map October 2, 2015

Existing Conditions

Topography

The Project site is located on relative flat terrain that lies between a railroad right-of-way and the Petaluma River. No structures currently exist on the site. Elevations on the Project site vary from a maximum elevation of approximately 36 feet above sea level at the southern portion of the site, to approximately 16 feet at the present terminus of Graylawn Avenue. There are several small, localized depressions that pond rainfall and may create areas of adjacent wetlands (this is described more thoroughly in the Biological Resources section of this Draft EIR).

Climate

The climate of the Project vicinity is Mediterranean, typified by dry, warm summers and cool, wet winters. The nearest and most climatically similar climate station to the Project site is in Petaluma at Petaluma Fire Station #3, located approximately eight miles southeast of the site. For the period of

record 1893 - 2016 the total annual average rainfall near the Project site was 24.89 inches, with most precipitation occurring from November to March. The highest recorded annual rainfall was 45.93 inches (1998), while the lowest annual rainfall was 5.62 inches (2013). The maximum daily rainfall for the period of record occurred on December 27, 2004, when 4.295 inches fell. The record indicates no snowfall near the Project site during this period. Average annual temperatures, in Fahrenheit, range from a high of 81.8 degrees (July) to a low of 37.6 degrees (January). The highest and lowest temperatures ever recorded are 110 degrees (June 2, 1960), and 16 degrees (December 12, 1932), respectively.[1]

Regional Hydrology

The site drains to the Petaluma River. The Petaluma River watershed is in southern Sonoma and northern Marin Counties. Elevations in the watershed range from sea level at San Pablo Bay to about 3,000 feet mean sea level (MSL) at Sonoma Mountain. Tributaries to the Petaluma River include Petaluma Creek, Willow Brook Creek, Lichau Creek, Capri Creek, Lynch Creek, Washington Creek, and Adobe Creek, to name a few. The Regional Water Quality Control Board (RWQCB) Basin Plan for the San Pablo Basin classifies the following streams within the City of Petaluma Urban Growth Boundary as major surface waters: Petaluma River, Willow Brook Creek, and Adobe Creek. Tidal influence commonly extends approximately 14 miles upstream of San Pablo Bay, to near the confluence of Lynch Creek above downtown Petaluma and just downstream of the Project site, and is known to extend upstream of the project site as far as the confluence of Capri Creek.

Flooding

The following excerpt from the Petaluma General Plan 2025, Water Resources Element provides a summary of general flooding conditions along the Petaluma River.

> "Floods in the Petaluma River Basin are normally of short duration, lasting 3 to 4 days, or less. Tributaries of the Petaluma River can begin to rise within hours after a heavy storm event has begun if antecedent soil moisture content is already high. Typically floods occur between December and March.
>
> Flooding has taken place in the City, to the extent that at least some street flooding occurs, on average once per year over the past twenty or so years. Recent significant flooding events (meaning street and structural flooding) have occurred in Petaluma in 1982, 1983, 1986, 1995, 1996, 1998, 2005, and 2014. The largest flood of record in the City of Petaluma occurred from January 3 through 5, 1982. A significant flood event occurred on December 30-31, 2005, over-taxing both piped and open channel systems. Street and parking lot flooding occurred in January of 2017.
>
> Including the Petaluma River, there are approximately 18 miles of channels that have been studied in detail by the Federal Emergency Management Agency (FEMA) within the City. Based on the historic records of flood events and the detail to which streams have been studied and floodplains delineated within the City by FEMA, flooding is a significant problem.
>
> The City has put forth significant effort to address its flooding problems. Evidence of this is the City's involvement in the National Flood Insurance Program (NFIP) Community Rating System (CRS). Community participation in the CRS is voluntary. There are 10 CRS classes based on a point system

[1] Petaluma Fire Station 3, California, Period of Record General Climate Summary 1893 - 2016, found at http://www.wrcc.dri.edu/cgi-bin/cliMAIN.pl?ca6826

that assigns a rating: Class 1 requires the most credit points and gives the greatest premium reduction; Class 10 receives no premium reduction."

Petaluma is currently rated as Class 6.

Flood Control Efforts

Several areas in Petaluma have historically experienced significant flooding. Those areas closest to the Project site are the Payran Street neighborhood, and areas adjacent to the Petaluma River.

Following the 1986 flood in Petaluma, the City began intensive work efforts with the U.S. Army Corps of Engineers on a project to reduce the potential for flooding in Petaluma. Between 1997 and 2008, nearly $40 million in improvements on the Petaluma River Flood Control Project were completed, including replacement of the Lakeville and Payran Street bridges, construction of the U-shaped channel and trapezoidal channel (between Lynch Creek confluence with the Petaluma River downstream to below Lakeville Street), removal and replacement of the mainline railroad bridge at Lakeville Street, construction of the approaches to the mainline railroad bridge, removal of the railroad spur bridge downstream of Lakeville Street, and construction of the industry railroad spur (constructed rather than build a second railroad bridge over the River). The last remaining portion of the Payran Flood Control Project, the Sheetpile Wall Project directly adjacent and upstream of the replaced railroad trestle bridge on Lakeville Street, was completed by the close of 2015.

Beginning in November 2008, the City submitted a preliminary Map Revision to FEMA, requesting that FEMA consider revisions to the then-effective 1989 Flood Insurance Rate Maps (FIRM) for the City, based on the city's high performance storm water monitoring model (XP-SWMM storm water model), including its more accurate topographical input data and reliance on almost 100 years of Petaluma rainfall data (including data from New Year's Eve 2005) and previous flood events. In October of 2011, FEMA accepted the XP-SWMM hydraulic model and technical data to be used to update the FIRM maps. In April of 2012, FEMA released their draft FIRM panels and Flood Insurance Study for review. After a public review process, the new FIRM maps became effective February 19, 2014. Subsequently, FEMA prepared Bay Coastal Study Maps, which evaluated effects of coastal wave surge within the San Pablo Bay and upstream into the Petaluma River. The maps became effective on October 2, 2015.

Local Flooding Conditions

The timing of tributary flood peaks to the Petaluma River depends on the size and shape of each contributing watershed as well as the amount of floodplain storage along the main tributaries. Floodplain storage areas are areas adjacent to the River that become inundated during the peak flows. Stormwater volume is temporarily stored in these areas, reducing peak flows downstream. As the storm passes, the water surface elevation recedes back to the river channel after the peak flow has passed.

Most significant floodplain storage is located upstream of the confluence of Willow Brook Creek at the headwaters of the Petaluma River. There is a natural storage area where Liberty Creek, Marin Creek and Wiggins Creek converge on the southwest side of Highway 101 as well as floodplain storage adjacent to Willow Brook Creek on the northeast side of Highway 101. According to model simulations prepared by WEST Consultants, Inc. (retained by the City of Petaluma during the General Plan Update process to evaluate the flooding impacts of development under the proposed General Plan 2025 using the City's XP-SWMM computer model), peak flows from Corona Creek/Capri Creek and Lynch Creek arrive a few hours before the Petaluma River peak.

Just upstream of the confluence of Washington Creek with the River, the tide has historically had a significant influence on flood levels. When the Petaluma River flood peak coincides with a high tide, the flood levels are significantly higher.

Site Hydrology

Surface Runoff

The site is currently undeveloped and comprised of a fallow field of grasses and shrubs. There are no concentrated drainage pathways on the site. Runoff collects in localized depressions or is concentrated in shallow swales, and leaves the site as shallow concentrated sheet flow into the Petaluma River at several locations. Runoff that does not collect within the low spots on the site flows overland and joins the Petaluma River at no specific discharge point.

Flooding

A portion of the Project site is located within the currently FEMA-defined floodplain of the Petaluma River. **Figure 11-1** shows the current (2014) FEMA National Flood Hazards as applicable to the Project site. Data shown on this image is from the Flood Insurance Rate Maps (FIRMs), where available digitally. The FIRMs indicates that the 100-year base flood ranges from approximately 19 feet to 21 feet NAVD88 (North American Vertical Datum, 1988).

Water Quality

The Petaluma River is considered an impaired water body due to sedimentation/siltation and high levels of nutrients and pathogens, and human-generated debris and pesticide use. The Clean Water Act's Section 303(d) list includes nutrients, pathogens, and sediment as "medium priority" pollutants, while diazinon and nickel are listed as "low priority" pollutants for the Petaluma River. High nutrient levels could be attributed to dairy farms, equine facilities, and livestock producers and/or over fertilization. Sedimentation problems in tributaries are generally associated with new development and agricultural land use practices. Pathogen problems are generally attributed to agriculture and urban runoff (agricultural and domestic animal waste).

The California Environmental Protection Agency and the San Francisco Bay Regional Water Quality Control Board list existing beneficial uses for the Petaluma River, Willow Brook Creek, and Adobe Creek in the Water Quality Control Plan (Basin Plan) for the San Francisco Bay Basin. Existing beneficial uses for the Petaluma River include a cold freshwater habitat, marine habitat, fish migration, navigation, preservation of rare and endangered species, water contact recreation, non-contact water recreation, fish spawning, warm freshwater habitat, and wildlife habitat.

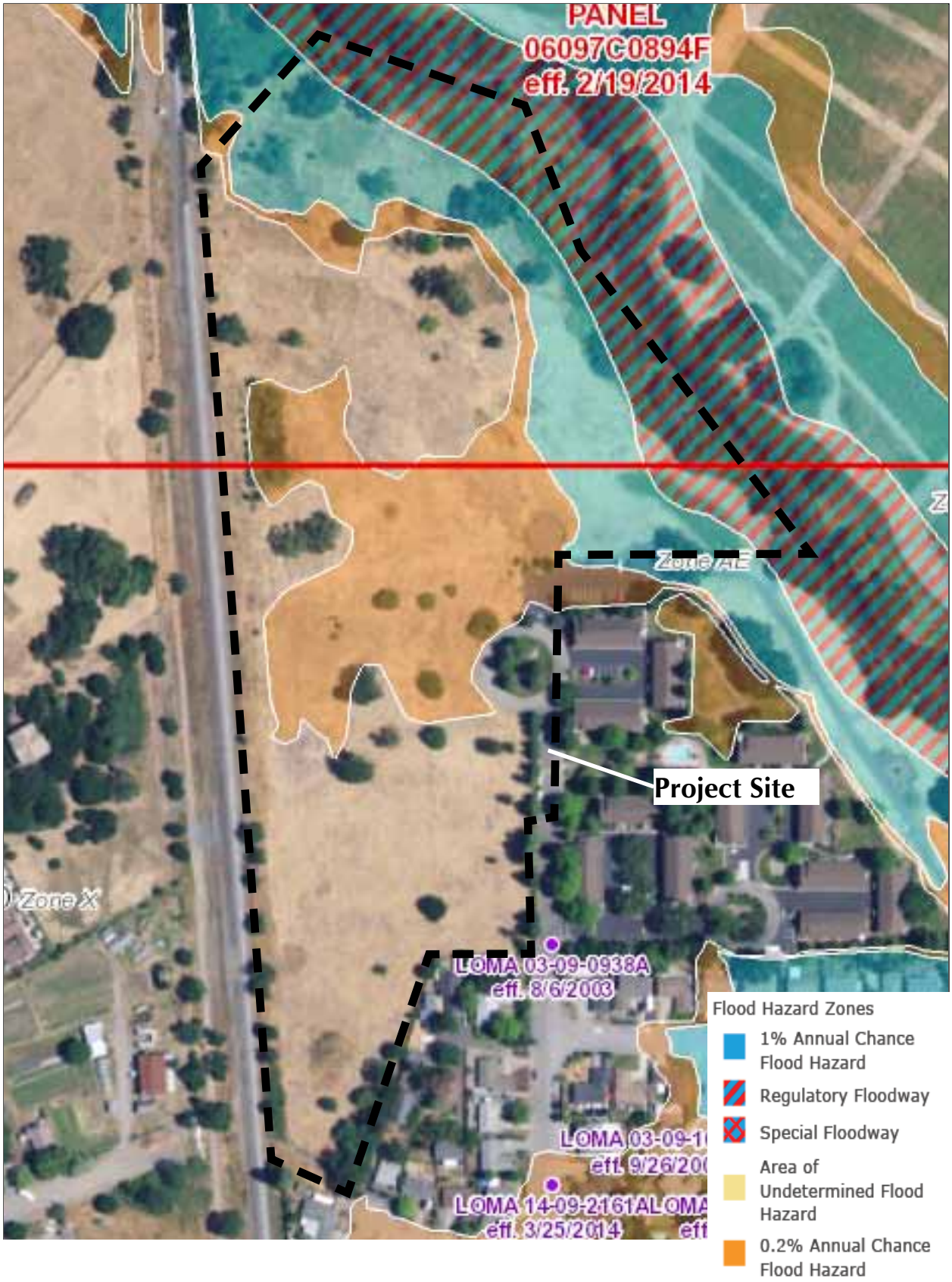

Figure 11-1
FEMA National Flood Hazard Boundaries
(Effective date February 18, 2014)

Source: http://fema.maps.arcgis.com/home/webmap/viewer.html?webmap=cbe088e7c8704464aa0fc34eb99e7f30&extent=-122.81060821289036,38.18797534477562,-122.47827178710958,38.276970443709835

Groundwater

The California Department of Water Resources (DWR) defines state groundwater basins based on geologic and hydro-geologic conditions. Rivers and stream corridors are important source areas for groundwater recharge, as are some upland areas underlain by permeable formations. When impervious surfaces are placed over groundwater recharge areas, the percolation of surface water into the underlying water table is impaired and the surface water runs off, sometimes results in a decrease in groundwater recharge.

The Project site is in the Petaluma Valley groundwater basin. The Petaluma Valley basin is 46,000 acres in size, with total maximum well yields of 100 gallons per minute (gpm).

Regulatory Setting

The proposed Project must be constructed in accordance with several regulatory programs, laws, and regulations that aim to protect surface water resources. In some cases, Federal laws are administered and enforced by state and local government. In other cases, state and local regulations in California are stricter than those imposed by federal law. Except for water quality issues, most of the regulations affecting water resources (both surface water and groundwater) are contained in the City of Petaluma and/or Sonoma County Water Agency (SCWA) Municipal Code and related ordinances. In addition to City and County ordinances, the City of Petaluma participates in the National Flood Insurance Program (NFIP) administered by the Federal Emergency Management Agency (FEMA).

The State Water Resources Control Board (SWRCB) and the nine Regional Water Quality Control Boards (RWQCBs) are the principal state agencies with responsibility for the coordination and control of water quality. Per the Water Code, the SWRCB is generally responsible for setting statewide water quality policy and is solely responsible for the allocation or determination of surface water rights. The RWQCBs are responsible for water quality planning and regulatory decisions for their respective regions.

The City of Petaluma is located within the San Francisco Bay (Region 2) RWQCB, which includes the Petaluma River. The RWQCBs have the authority to implement water quality protection standards through the issuance of permits for discharges to waters at locations within their respective jurisdictions. The SWRCB and the nine RWQCBs implement the state and federal clean water laws, including the National Pollutant Discharge Elimination System (NPDES) permitting process. As authorized by the Clean Water Act, the NPDES permit program controls water pollution by regulating point source discharges from industrial, municipal, and other facilities if their discharges go directly to surface waters of the United States.

This section summarizes relevant regulatory programs, laws, and regulations with respect to hydrology and water quality and how they relate to the proposed Project.

Federal Laws and Regulations

Clean Water Act

The Clean Water Act (CWA), enacted in 1972, regulates the discharge of pollutants to waters of the United States from any point source. Section 401 of the CWA requires water quality certification for any activity, including the construction or operation of a facility, which may result in any discharge into navigable waters (Title 33 CFR §1341). Section 404 of the CWA requires a permit for the discharge of dredged fill material into navigable waters at specified disposal sites (Title 33 CFR §1344). In 1987, amendments to the CWA added Section 402(p), which establishes a framework for regulating non-point

source stormwater discharges under the National Pollutant Discharge Elimination System (NPDES). The NPDES stormwater program is further described below under the "State Regulations" subsection.

National Flood Insurance Program

The Federal Emergency Management Agency (FEMA) – a former independent agency that became part of the new Department of Homeland Security in March 2003 – is tasked with responding to, planning for, recovering from, and mitigating against disasters. FEMA is responsible for determining flood elevations and floodplain boundaries based on U.S. Army Corps of Engineers studies and approved agencies studies and for coordinating the federal response to floods, earthquakes, hurricanes, and other natural or man-made disasters and providing disaster assistance to states, communities and individuals. FEMA distributes the Flood Insurance Rate Maps (FIRMS), which are used in the National Flood Insurance Program (NFIP). These maps identify the locations of special flood hazard areas (SFHAs), including the 100-year base floodplain.

California Laws and Regulations

Porter-Cologne Water Quality Control Act

The California State Water Resources Control Board (SWRCB) and the nine Regional Water Quality Control Boards (RWQCB) have the responsibility in California to protect and enhance water quality, both through their designation as the lead agencies in implementing Section 319, non-point source program of the federal Clean Water Act and through the State's primary water pollution control legislation, the Porter-Cologne Water Quality Control Act. The SWRCB establishes statewide policies and regulations for the implementation of water quality control programs mandated by federal and state water quality statutes and regulations. The RWQCBs develop and implement Water Quality Control Plans (Basin Plans) that consider regional beneficial uses, water quality characteristics, and water quality problems. All projects resulting in discharges, whether to land or water, are subject to regulation (Section 13263 of the California Water Code) under the Porter-Cologne Act and are required to obtain approval of Waste Discharge Requirements (WDRs) by the RWQCBs. WDRs for discharges to surface waters also serve as NPDES permits.

The San Francisco Bay office (Region 2) of the RWQCB regulates surface water and groundwater quality for its region, which includes Sonoma County, through designation of beneficial uses, establishment of water quality objectives, and administration of the NPDES permit program for stormwater and construction site runoff. The RWQCB is also responsible for providing permits and water quality certifications pursuant to the CWA.

NPDES Permit Requirements

In Petaluma and the Bay Area, NPDES permits are administered by the San Francisco Bay Regional Water Quality Control Board (RWQCB), a division of the State Water Resources Control Board (SWRCB). Phase I of the NPDES program covered discharges from industrial sites, construction sites larger than five acres, and municipal separate storm sewer systems (MS4s) serving populations of more than 100,000 people. The Phase II expansion of the MS4 program in 1999 expanded its coverage to include "Small" MS4s. Because Petaluma is a designated urbanized area (but serving less than 100,000 people), its storm water discharges are permitted under the NPDES requirements for Small MS4s.

The SWRCB has established a general permit process that allows the Board to efficiently regulate storm water discharges from Small MS4s. The current general permit is the SWRCB-adopted General Permit for the Discharge of Storm Water from Small MS4s (Water Quality Order No. 2013-0001-DWQ, NPDES

General Permit No. CAS000004). All eligible MS4s are required to comply with its provisions, which include construction- and post construction-phase stormwater runoff controls and water quality best management practices (BMPs) for new development.

Per the Storm Water Phase II Rule, small MS4 owners/operators must reduce pollutants in storm water to the maximum extent practicable (MEP) to protect water quality. The regulations specify that compliance with the MEP requirement can be attained by developing a storm water management plan that addresses the six minimum control measures described in the storm water regulations.

The general permit provisions include post-construction provisions to prevent non-storm water discharges, minimize the discharge of pollutants in storm water runoff, and prevent a development-caused worsening of stream channel erosion and sediment deposition resulting from hydromodification of a watershed. To minimize pollutant discharges, projects must provide the capacity to either infiltrate or evapotranspire all runoff generated by the 85th percentile storm event, typically through the application of low impact development (LID) design principles that seek to minimize the amount of land covered by impervious surfaces and maximize opportunities for infiltration. Treatment measures must be provided for runoff that cannot be diverted from the site's storm water discharges in this way, using specified Best Management Practices that can remove or otherwise neutralize identified pollutants. High flow rates that cannot be sufficiently reduced by site design strategies must be controlled through the provision of detention storage or through stabilization of downstream conveyances that would be adversely affected. Because these required treatment and detention facilities will require maintenance for the life of a development project, developers must also establish a dedicated funding responsibility for either the future owners of the land or a designated public entity. In its role as an MS4 operator and permit holder, the City of Petaluma is required to enforce these site design and water quality protection measures for all new and redevelopment projects within its jurisdiction.

Construction Sites

The State Board administers the NPDES General Permit for Discharges of Stormwater Runoff Associated with Construction Activity (General Construction Permit). To cover a construction project disturbing 1 acre or more of land under the General Construction Permit, a project must submit a Notice of Intent to the State Board prior to the beginning of construction. Effective July 1, 2010, all dischargers are required to obtain coverage under the Construction General Permit Order 2009-0009-DWQ adopted on September 2, 2009, as amended by 2010-0014-DWQ and 2012-006-DWQ. The General Construction Permit requires that projects develop and implement a SWPPP, identifying potential sources of pollution and specifying runoff controls during construction to minimize the discharge of pollutants in stormwater from the construction area. The SWPPP should contain a site map that shows the construction site perimeter, existing and proposed buildings, lots, roadways, storm water collection and discharge points, general topography both before and after construction, and drainage patterns across the project. The SWPPP must list Best Management Practices (BMPs) the discharger will use to protect storm water runoff and the placement of those BMPs. Additionally, the SWPPP must contain a visual monitoring program; a chemical monitoring program for "non-visible" pollutants to be implemented if there is a failure of BMPs; and a sediment monitoring plan if the site discharges directly to a water body listed on the 303(d) list for sediment.

The permit also includes post-construction standards with the requirement for all construction sites to match pre-project hydrology to ensure that the physical and biological integrity of aquatic ecosystems is maintained. This “runoff reduction” approach is analogous in principle to Low Impact Development (LID) and will serve to protect related watersheds and water bodies from both hydrologic-based and pollution impacts associated with the post-construction landscape.

Streambed Alteration Agreement

The California Department of Fish and Wildlife requires a Streambed Alteration Agreement prior to any construction activity occurring within the bed, channel or banks of any California river, stream or lake (see Sections 1601-1603 of the Fish and Game Code).

Regional and County Regulations

San Francisco Bay Water Quality Control Plan (Basin Plan)

The San Francisco Bay RWQCB is responsible for the development, adoption, and implementation of the Water Quality Control Plan for the San Francisco Bay region. The Basin Plan is the master policy document that contains descriptions of the legal, technical, and programmatic bases of water quality regulation in the San Francisco Bay Region. The Basin Plan identifies beneficial uses of surface waters and groundwater within its region and specifies water quality objectives to maintain the continued beneficial uses of these waters. The proposed Project is required to adhere to all water quality objectives identified in the Basin Plan.

Beneficial Uses of Surface Waters and Groundwater

The Basin Plan defines beneficial uses for surface waters and groundwater in its corresponding jurisdiction. The beneficial uses of surface waters in Petaluma River include wildlife habitat, municipal and domestic supply, agricultural supply, and industrial supply.

NPDES Permit Requirements

In Petaluma and the Bay Area, NPDES permits are administered by the San Francisco Bay Regional Water Quality Control Board (RWQCB), a division of the State Water Resources Control Board (SWRCB).

Local Programs and Regulations

City of Petaluma Storm Water Program

Operators of municipal storm sewer systems are regulated under the CWA, which requires them to comply with the permitting provisions of the NPDES. To meet this requirement, in November, 2003 the City of Petaluma adopted a Small MS4 NPDES Storm Water Management Plan (SWMP), which describes, among other things, the City's measurable water quality goals, a timetable for achieving these goals in compliance with NPDES regulations, and recommended best management practices for the protection of surface water quality during construction and throughout the life of public and private development projects. The City's Storm Water Program is responsible for implementation of this plan, which, during the initial permit term, has focused on identifying the BMPs that can most effectively reduce the concentrations of pathogens, nutrients, pesticides, and sediment in the City's storm water. In addition, the Storm Water Program reviews all SWPPPs prepared for private development projects in the City to ensure they conform to the City's SWMP. As such, developers will likely need to incorporate additional BMPs beyond those discussed in the SWMP to comply with the NPDES requirements.

City of Petaluma Floodway and Floodplain Districts Ordinance

Chapter 6 of the City's Implementing Zoning Ordinance (IZO) is the City's Floodway and Floodplain Districts Ordinance, which restricts the use of properties or portions of properties that are situated within the Petaluma River Basin Floodplain and Floodway areas, as defined in the ordinance.

The City of Petaluma's Implementing Zoning Ordinance sets measures for the construction, location, conversion, or alteration of any structures or land contained within FEMA designated flood hazard zones in the City. [2] A permit is required for development within a flood zone, and the development must adhere to the standards for fill placement and construction elevation set forth in the ordinance.

In addition, the City of Petaluma requires projects to comply with the Sonoma County Water Agency (SCWA) Flood Control Design Criteria for the design and construction of drainage structures and facilities within the City. Proposed projects are subject to review by the SCWA and City. Alternatives to the Flood Control Design Criteria must be approved prior to construction.

City of Petaluma Municipal Code (current through Ordinance 2573, adopted March 22, 2016)

Chapter 15.80 of the City's Municipal Code ("Stormwater Management and Pollution Control") regulates stormwater discharges.

Grading and erosion control requirements are set forth in Chapter 17.31 of the Municipal Code.

Local Hazard Mitigation Plan

To maintain compliance with federal regulations 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.[3]

Storm Drain Impact Fees

In September 1982, the Petaluma City Council established the Storm Drainage Impact Fee as a means of mitigating storm drainage impacts occurring because of development. The criteria provide for either the payment of fees or the construction of on- or off-site detention areas, based upon the type of project and amount of runoff generated, as calculated for a 100-year storm. Fees collected are used by the City for the acquisition, expansion, and development of storm drainage improvements.

City of Petaluma General Plan

The City of Petaluma adopted its current General Plan in 2008 to guide development in Petaluma through buildout. Chapter 8, the Water Resources Element includes goals and policies related to surface water management, water quality, and sustainable site planning to improve natural hydrologic functions and water quality. The General Plan 2025 Policies that pertain to the Petaluma River system and that are applicable to the Project include, but are not limited to the following:

> **Policy 8-P-20:** Manage groundwater as a valuable and limited shared resource by protecting potential groundwater recharge areas and streamsides from urban encroachment within the Petaluma watershed.

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[2] *Chapter 6, Floodway and Floodplain Districts Implementing Zoning Ordinance* Petaluma, CA, as of June 2008.

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

Control construction of impervious surfaces in groundwater recharge areas. Potential recharge area protection measures at sites in groundwater recharge areas include, but are not limited to:

a. Restrict coverage by impervious materials;

b. Limit building or parking footprints;

c. Require construction of percolation ponds on site;

d. Require surface drainage swales.

Policy 8-P-28: The area upstream of the Corps weir, and below the confluence of Willow Brook Creek with the Petaluma River, located within the 1989 FEMA floodplain (and any amendments thereto) shall include a Petaluma River Corridor (PRC) set aside for the design and construction of a flood terrace system to allow the River to accommodate a 100-year storm event within a modified River channel, to the extent feasible given existing physical and natural constraints.

a. The Water Resources and Conservation Department shall work with the Community Development Department, through the project entitlement process, to insure the PRC is implemented at the cost of the development.

b. Maintenance, in perpetuity, of the PRC and applicable flood terrace, storm water flow capacity, environmental habitat and public access improvements shall be maintained through a funding mechanism approved by the City.

Policy 8-P-29: The City of Petaluma, SCWA, Sonoma County and other responsible agencies shall be encouraged to work together to create and adopt a flood management plan, or plan amendment to the Petaluma River Watershed Master Drainage Plan (SCWA, June 2003), for the Petaluma River watershed implementing the following regional surface water solutions; or a reasonable segment thereof:

a. Establish a Petaluma River and creek corridor setback for the design and construction of a flood terrace system to allow the Petaluma River (Corona and Denman Reaches), along with Willow Brook, Marin, and Liberty Creeks to accommodate a 1% (100-year) storm event within a modified channel section to the extent possible given existing natural and physical constraints.

b. Work with Sonoma County to create interim development standards for that setback area until such time as studies are concluded and approved by Sonoma County, the SCWA, and the City of Petaluma, and other responsible agencies. Thereafter, all lands affected shall set aside the necessary river and/or creek corridor areas and, as development occurs, shall undertake the identified surface water containment enhancement improvements envisioned in Program A, above. The following components, at a minimum, shall be included in the interim development standards called for above:

    i. Compliance with No Net Fill.

    ii. Elevation of finished floor at least two feet above Base Flood Elevation (BFE).

    iii. Construction of a flood terrace in the setback area to convey the 1% (100-year) design storm, to the extent possible, in accordance with City and SCWA requirements.

    iv. Payment of a hydraulic/hydrology model update fee for evaluating the proposed project, cumulative impacts and the related mitigations, to the regional surface water conveyance system.

    v. Payment of a proportionate share of regional flood mitigation costs.

c. The City will work with the County to ensure that zero net fill policies are enforced within the unincorporated area for areas within the regulatory floodplain of the Petaluma River and its tributaries.

Policy 8-P-30: Within a 200’ setback from centerline of the Petaluma River, within the UGB, no additional development shall be permitted on lands within that 400’ wide corridor, given natural and physical

constraints, unless the proposed development fully complies with the interim development standards as defined in 8-P-29-B, until such time as the study referred to in Policy 8-P-29-B is concluded and approved by the SCWA and City of Petaluma. Thereafter, all lands affected shall set aside the necessary river and/or creek corridor areas and, as development occurs, shall undertake the identified surface water containment enhancement improvements.

a. The watershed model, XP-SWMM or updates thereto, shall be maintained, in cooperation between the City and SCWA, to assist in the evaluation of development proposals and in the design of regional watershed improvements to reduce flood elevations.

b. Proposed development applications may be charged a model update fee to cover costs associated with evaluating a specific proposal for project specific and cumulative impacts to the regional surface water system.

c. On-site and off-site requirements, deemed necessary by the City of Petaluma, to reduce the surface water impacts associated with a specific development proposal shall be designed, constructed, and maintained in perpetuity at the cost of the development associated with said impacts.

Policy 8-P-31: In accordance with the studies undertaken for the Corps Flood Protection project, existing areas subject to periodic surface water inundation and containment, within the Corona and Denman Reaches (Lynch Creek confluence with the Petaluma River upstream to the Old Redwood Highway over-crossing of Willow Brook Creek), shall be preserved and enhanced where feasible to reduce localized flooding.

a. The Department of Water Resources and Conservation shall work with the SCWA and the Community Development department to ensure that reduction of the protection afforded by the Payran Corps Flood Protection Project is not compromised or significantly reduced by proposed development.

b. Continue to work with SCWA for the on-going efforts to maintain or improve historic channel capacity for floodwaters.

Policy 8-P-33: The City shall continue to implement mandatory zero-net fill upstream of the Payran weir and when appropriate, utilize zero-net runoff, to assess site-specific impacts and identification of mitigations.

a. The Development Code shall be amended to include dirt, existing or fill, between the regulatory 100-year flood elevation and the required minimum elevation for the first finished floor in the calculation of zero-net fill displacement or placement. Any project within an area subject to inundation in a 1% (100-year) storm event shall include site-specific analysis of impacts and identification of mitigations.

Policy 8-P-36: Require development on sites greater than ¼ acre in size to demonstrate no net increase in peak-day stormwater runoff, to the extent deemed practical and feasible.

Policy 8-P-37: No new inhabited structure or development shall be entitled within that portion of properties containing areas of water depths exceeding one foot, unless mitigation and/or on-site or off-site improvements are constructed to reduce the 100-year flood depth to less than 1 foot.

a. The City shall maintain a 2-D model of the Petaluma River within the City of Petaluma and continue to work with SCWA to achieve a 2-D model for the Petaluma Watershed.

b. Utilizing the 2-D model, the City of Petaluma will work with SCWA to identify, design, fund, and construct regional solutions to minimize the flooding impacts associated with historic and increasing out-of-bank flows which occur from increasing storm flow and velocity from out-of-City areas into the City.

c. Working with Sonoma County, the City will continue to ensure that zero net fill policies are enforced within the unincorporated areas for areas encumbered by the regulatory floodplain of the Petaluma River.

d. Utilizing an approved modeling tool, the City shall diligently pursue the remapping of the regulatory Floodway and Floodplain, through the Corps of Engineers, following the completion of the Payran Reach Corps project.

e. New non-residential development in the 100-year flood boundary area, identified in Figure 8-1, with less than one foot of water depth during a 100-year storm event will be required to provide flood protection at least 1 foot above the BFE, or elevate the lowest floor two feet above the BFE.

f. Residential development shall be prohibited on the first floor of new structures within the regulatory floodplain after remapping of the FEMA floodway/floodplain.

g. After remapping the City should pursue acquisition of properties in the regulatory Floodway and seek funding for implementation of surface water improvements and riparian habitat enhancements.

Policy 8-P-38: All development activities shall be constructed and maintained in accordance with Phase 2 National Pollutant Discharge Elimination System (NPDES) permit requirements.

a. The Water Resources and Conservation Department shall review, and have the authority to conditionally approve, all development permits to insure compliance with NPDES Phase 2 requirements.

b. Maintain, update as needed, and implement the City's Storm Water Management Plan to retain a current storm water discharge permit with the California Regional Water Quality Control Board.

c. A funding mechanism, such as a storm water utility fee, shall be implemented by the City to insure a dedicated source of funds is available for all surface water drainage system maintenance and improvement needs.

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 hydrological resources would be considered significant if it would:

1. Substantially deplete groundwater supplies or interfere substantially with groundwater recharge;
2. Substantially alter the existing drainage pattern of the site or area, including through alteration of the course of a stream or river in a manner that could result in substantial offsite erosion or siltation;
    1. Substantially increase the rate or amount of surface runoff, which would exceed capacity of existing or planned storm drain facilities, cause downstream or offsite drainage problems, or increase the risk or severity of flooding in downstream areas;
    2. Violate any water quality standards or waste discharge requirements or otherwise substantially degrade surface water quality;
    3. Result in construction of habitable structures within a 100-year floodplain as mapped on a Federal Flood Hazard Boundary or Flood Insurance Rate Map or other flood hazard delineation map, which would expose people or structures to a significant risk of loss, injury or death due to flooding;
    4. Locate structures within a 100-year flood hazard area that would impede or redirect flood flows;

5. Expose people or structures to a significant risk of loss, injury, or death involving flooding as a result of the failure of a levee or dam, or expose people or structures to a significant risk of loss, injury or death as a result in inundation by seiche, tsunami, or mudflow.

Increased Pollution, Erosion and Siltation during Construction

Hydro-1: During construction, the Project could alter existing drainage patterns of the site in a manner that could result in substantial erosion or siltation, and provide substantial additional sources of polluted runoff. (**Less than Significant with Mitigation**)

During construction, the Project will cause a temporary increase in the potential for soil loss and erosion, and an increase in sediment and polluted runoff may be delivered to the Petaluma River. Construction of the proposed Project would involve disturbance of soils and vegetated areas at the Project site, thereby making it susceptible to increased erosion. The Project's proposed grading plan indicates approximately 43,960 cubic yards (CY) of cut (including approximately 21,260 CY of soil removal for river terracing), and approximately 29,490 CY of fill. These construction activities would present the potential for soil erosion by subjecting unprotected bare soil areas to the erosional forces of runoff.

The newly graded and exposed floodplain terraces along the Petaluma River could contribute fine sediment and silt if not properly stabilized.

Additionally, the operation of large construction equipment could result in the contribution of petroleum hydrocarbons and heavy metals in construction-period stormwater runoff.

Required Agency Permits and Approvals

To address construction-period erosion and siltation, as well as the introduction of construction-related sources of water pollution, the Project applicant will be required to demonstrate compliance with all the following regulatory requirements.

Notice of Intent

As a condition of Project approval and prior to start of grading or other construction activities, the Project applicant shall file a Notice of Intent (NOI) with the RWQCB for compliance with the NPDES General Construction Activities Permit. It is the responsibility of the property owner to obtain coverage under the Permit prior to site construction. The Project Applicant is required to submit a Notice of Intent (NOI) with the State Water Resource Control Board's (SWRCB) Division of Water Quality, and that NOI must include general information on the types of construction activities that will occur on the site.

Storm Water Pollution Prevention Plan

The Project would disturb more than one acre of land. Therefore, in accordance with National Pollution Discharge Elimination System (NPDES) regulations, the Project applicant is required to prepare a site-specific Storm Water Pollution Prevention Plan (SWPPP) per NPDES general construction permit requirements through the State Water Resources Control Board (SWRCB). The SWPPP shall be implemented throughout the Project's construction period(s) to control erosion on the Project site. The SWPPP would address potential erosion and sedimentation issues through a project-specific erosion control plan, as well as other best management practices (BMPs) to reduce the potential for spills and other contamination from on-site construction activities. Appropriate measures for control of sediment and other pollutants from construction sites are included in the "Construction Handbook of Best

Management Practices" (CASQA 2009). The SWPPP shall include guidelines for the storage, use and cleanup of fuels and hazardous materials. To help reduce the long-term accumulation of non-point source pollutants from the Project area within downstream surface waters, the applicant shall also incorporate long-term source control and pre-discharge treatment measures into the SWPPP.

The SWPPP will be subject to approval by the City Engineer and in conformance with all applicable RWQCB design standards.

Erosion Control Plan

As described in Chapter 8, Geology and Soils (MM Geo-6), the Project applicant shall also prepare and submit an Erosion Control Plan to be reviewed and approved by the City of Petaluma prior to issuance of a grading permit for the Project. The Erosion Control Plan shall include phasing of grading, limiting areas of disturbance, designation of restricted-entry zones, diversion of runoff away from disturbed areas, protective measures for sensitive areas, outlet protection and provision for revegetation or mulching. The Erosion Control Plan shall also prescribe treatment measures to trap sediment, such as inlet protection, straw bale barriers, straw mulching, straw wattles, silt fencing, check dams, terracing, and siltation or sediment ponds.

In addition, as described in Chapter 6: Biological Resources, the proposed Preliminary Habitat Mitigation and Monitoring Plan identifies restoration and replanting that would further stabilize slopes and minimize erosion, and MM Bio-6 requires a Terraced Grading Erosion Control Plan.

Mitigation Measures

In furtherance of the regulatory requirements identified above related to protection of water quality during grading and construction, the following additional mitigation measure is recommended to provide further detailed requirements to reduce and/or avoid adversely affecting water quality during construction.

Mitigation Measure Hydro-1: SWPPP Requirements. Design requirements and implementation measures for minimizing Project-generated erosion and for controlling fuel/hazardous material spills shall be set forth in the applicant's SWPPP, in accordance with State and RWQCB design standards. It is recommended that the SWPPP, at a minimum, include the following or similar provisions:

a) Leave existing vegetated areas undisturbed until construction of improvements on each portion of the development site is ready to begin;

b) Immediately re-vegetate or otherwise protect all disturbed areas from both wind and water erosion upon the completion of grading;

c) Collect storm water runoff into stable drainage channels, from small drainage basins, to prevent the buildup of large, potentially erosive storm water flows;

d) Direct runoff away from all areas disturbed by construction;

e) Use sediment ponds or siltation basins to trap eroded soils before runoff is discharged into onsite or off-site drainage culverts and channels;

f) Install straw rolls, straw bales or other approved materials below all disturbed areas adjacent to the Petaluma River and surrounding all wetland areas to be retained, to prevent eroded soils from entering the river channel. Maintain these facilities until all disturbed upslope areas are fully stabilized, in the opinion of the City Engineer;

g) To the extent possible, schedule major site development work involving excavation and earthmoving for construction during the dry season;

h) Develop and implement a program for the handling, storage, use, and disposal of fuels and hazardous materials. The program should also include a contingency plan covering accidental hazardous material spills;

i) BMPs shall be used for preventing the discharge or other construction-related NPDES pollutants beside sediment (i.e. paint, concrete, etc.) to downstream waters.

j) Avoid cleaning, fueling, or maintaining vehicles on-site, except in an area designated to contain and treat runoff; and

k) After construction is completed, inspect all drainage facilities immediately downstream of the grading site for accumulated sediment, and clear these facilities of debris and sediment as necessary.

Resulting Level of Significance

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 these necessary permits and approvals are obtained and their requirements are incorporated as components of, or conditions of approval for grading permits, the Project would not violate any adopted water quality standards or waste discharge requirements. It has been demonstrated that Mitigation Measure Hydro-1, when properly designed and implemented, can reduce effects on the quality of storm water runoff from construction sites to less-than-significant levels.

Operational Water Quality

Hydro-2: During Project operations, the Project would contribute runoff water that could provide substantial additional sources of polluted runoff and that could otherwise substantially degrade water quality. (**Less than Significant with Mitigation Measures**)

The long-term operation of the proposed Project as a new residential development would contribute to the levels of non-point sources of pollutants and litter entering downstream waters, including the Petaluma River and the San Francisco Bay. An increase in non-point sources of pollutants could have adverse effects on wildlife, vegetation, and human health. The proposed parking areas around the buildings are a source of suspended solids, petroleum hydrocarbons, and heavy metals. The landscaped areas between the buildings could contribute harmful landscape chemicals, pesticides, and fertilizers to runoff leaving the site.

The following **Table 11-1** presents a summary of potential pollutants that could be generated by the Project and which could contribute to the degradation of water quality.

Table 11-1: Potential Pollutants Generated by Land Use Type

Project Categories	Pathogens	Heavy Metals	Nutrients	Pesticides	Organic Compounds	Sediments	Trash & Debris	Oxygen-Demanding Substances	Oil & Grease
Attached Residential Development	P		X	X		X	X	P (1)	P (2)
Parking Lots		X	P (1)	P (2)		P (1)	X	P (5)	X
Streets, Highways & Freeways		X	P (1)		X (4)	X	X	P (5)	X

X = anticipated

P = potential

(1) A potential pollutant if landscaping exists on-site

(2) A potential pollutant if the project includes uncovered parking areas

(3) A potential pollutant if land use involves food or animal waste products

(4) Including petroleum hydrocarbons

(5) Including solvents

Source: California Stormwater Quality Association, 2003, California Stormwater BMP Handbook, New Development & Redevelopment

Required Agency Permits and Approvals

Similar to other projects within the City, the project will be required to comply with the NPDES General Permit for the Discharge of Storm Water from Small MS4s (SWRCB 2013), which prescribes methods for residential developments to control and treat stormwater runoff. The Small MS4 General Permit requires the Project proponent to incorporate site design measures, source controls, stormwater treatment measures, and/or other low impact development (LID) measures to reduce stormwater runoff and limit the transport of pollutants to receiving waters. The Small MS4 General Permit also requires implementation of source control measures for specific pollution-generating activities such as accidental spills or leaks, landscape/outdoor pesticide use, and for pools, ponds, or other water features.

Pursuant to the City of Petaluma's Stormwater Management and Pollution Control Ordinance, the Project will be required to demonstrate that appropriate BMPs including, but not limited to source control and post-construction treatment control measures will be implemented to control the volume, rate, and potential pollutant load of stormwater runoff from the site. The selection and the design of the BMPs, including post-construction treatment control measures, shall be per the City's Stormwater Policy and Design Standards, and per the applicable NPDES permit issued to the City and other available guidance documents (e.g., the California Stormwater Quality Association Best Management Practice Handbooks or equivalent).

Project's Proposed Storm Water Control Plan

The Project includes a preliminary Storm Water Control Plan (SWCP) that shows how the site would be drained by two storm drainage systems (see **Figure 11-2**). The first system collects runoff from the

northern portion of the site. Most of this drainage would be coming from access roads and parking areas. Runoff into this system would be collected in a series of subterranean storm drains that drain into a bioretention area in the northerly portion of the Project site, before it is discharged via a new storm drain outlet in the Petaluma River. The second collection system conveys runoff from parking areas and the proposed extension of Shasta Avenue onto the site. From the north end of the proposed Shasta Avenue extension, storm water would be discharged into a bioretention pond, and from there into a new storm drain outlet into the Petaluma River.

Prior to being discharged into this drainage system, much of the non-point source pollutants washed from roofs, landscape areas, and streets and parking areas would be filtered either through bio-filters located in open areas and parking lot swales, or through self-treating areas dispersed throughout seven Drainage Management Areas (DMA) throughout the Project site. The Project's on-site water quality detention basins (identified as treatment facilities B1 and E1 on Figure 11-2) would provide additional filtration of pollutants prior to discharge of stormwater into the River.

The Project will result in a total of approximately 364,730 square feet of impervious surface area (the Project site currently has no impervious surface area other than Graylawn Avenue and its cul-de-sac turn-around). The preliminary design of stormwater treatment facilities and other stormwater pollution control measures presented in the Preliminary SWCP are intended to be in accordance with the 2014 edition of the BASMAA Post-Construction Manual.[4] Based on the application of runoff factors (1.0 for pervious surfaces and 0.1 for landscaped areas) and a sizing factor of 0.04, the minimum requirement for bio-treatment facilities across all Drainage Maintenance Areas identified within the Project is 14,589 square feet. The Project proposes a total of 19,249 square feet of bioretention area (calculation details are provided in the SWCP, which is included in **Appendix 11C**).

Table 11-2 illustrates the drainage maintenance areas (DMAs), their surface types, and total area.

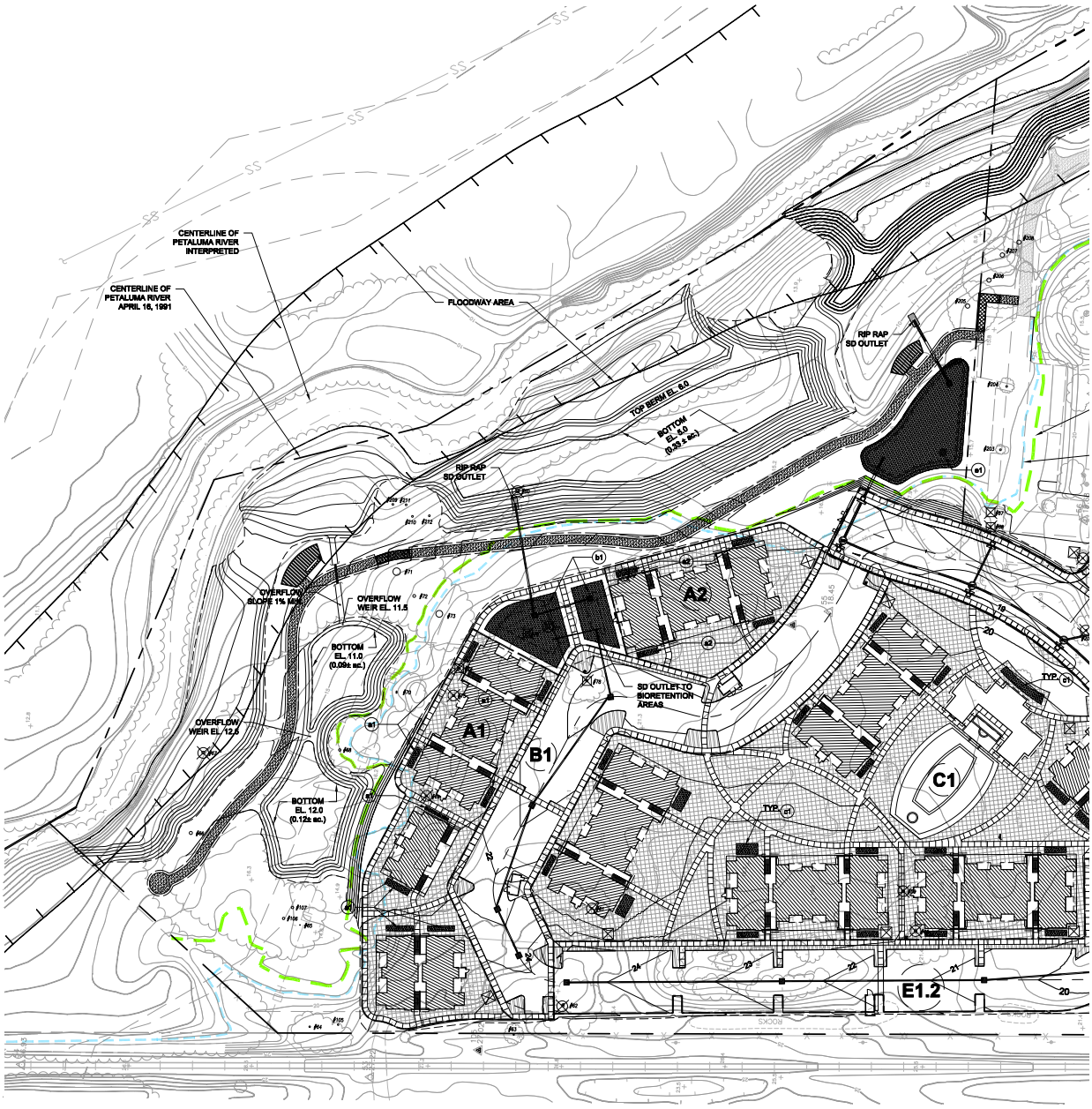
[4] BASMAA Post Construction Manual: Design Guidance for Stormwater Treatment and Control for Projects in Marin, Sonoma, Napa, and Solano Counties, July 14, 2014.

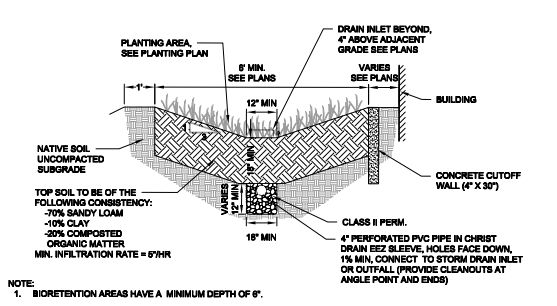
Table 11-2 Descriptions of each Drainage Management Area (DMA)

DMA Name	Impervious Area (SF)	Pervious Area (SF)	Treatment Needed (SF)	Treatment Area	Treatment Available (SF)
Self-Treating Areas					
A-1		12,730			
A2		7,979			
C1		81,345			
D3		7,380			
Sub-Total		**109,434**			
Bioretention Areas					
A1	21,121		845	A1	866
A2	10,438		418	A2	420
B1	42,085	2,667	1,683	B1	4,830
C1	92,731		3,709	C1	3,750
D1 s	28,775	3,769	1,151	D1	1,330
D2	10,797	6,994	432	D2	480
D3	10,226		409	D3	420
E1.1/E1.2	137,478	4,188	5.499	E1	6,343
F1	11,079		443	F1	810
Sub-Total	**364,730**	**17,818**	**14,589**		**19,249**
Total	364,730 (8.4 ac)	127,252 (2.9 ac)			

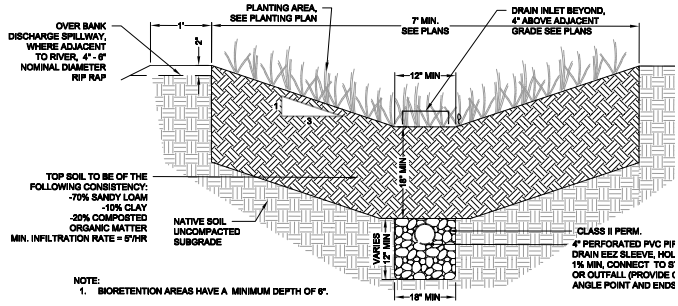
Source: Stormwater Control Plan for a Regulated Project: Sid Commons, and as updated by CSW/Stuber-Stroeh Engineering Group, Inc., Sheet C7, May 1, 2017

The SWCP also includes source control BMPs to minimize pollutant runoff from landscape maintenance, sidewalks, parking lots, and building roofs; and stormwater facility maintenance requirements that include preventative activities during construction as well as routine and post-storm measures during ongoing operations.





1 **BIORETENTION DETAIL (ADJACENT TO BUILDINGS)**
SCALE: 1/2" = 1'

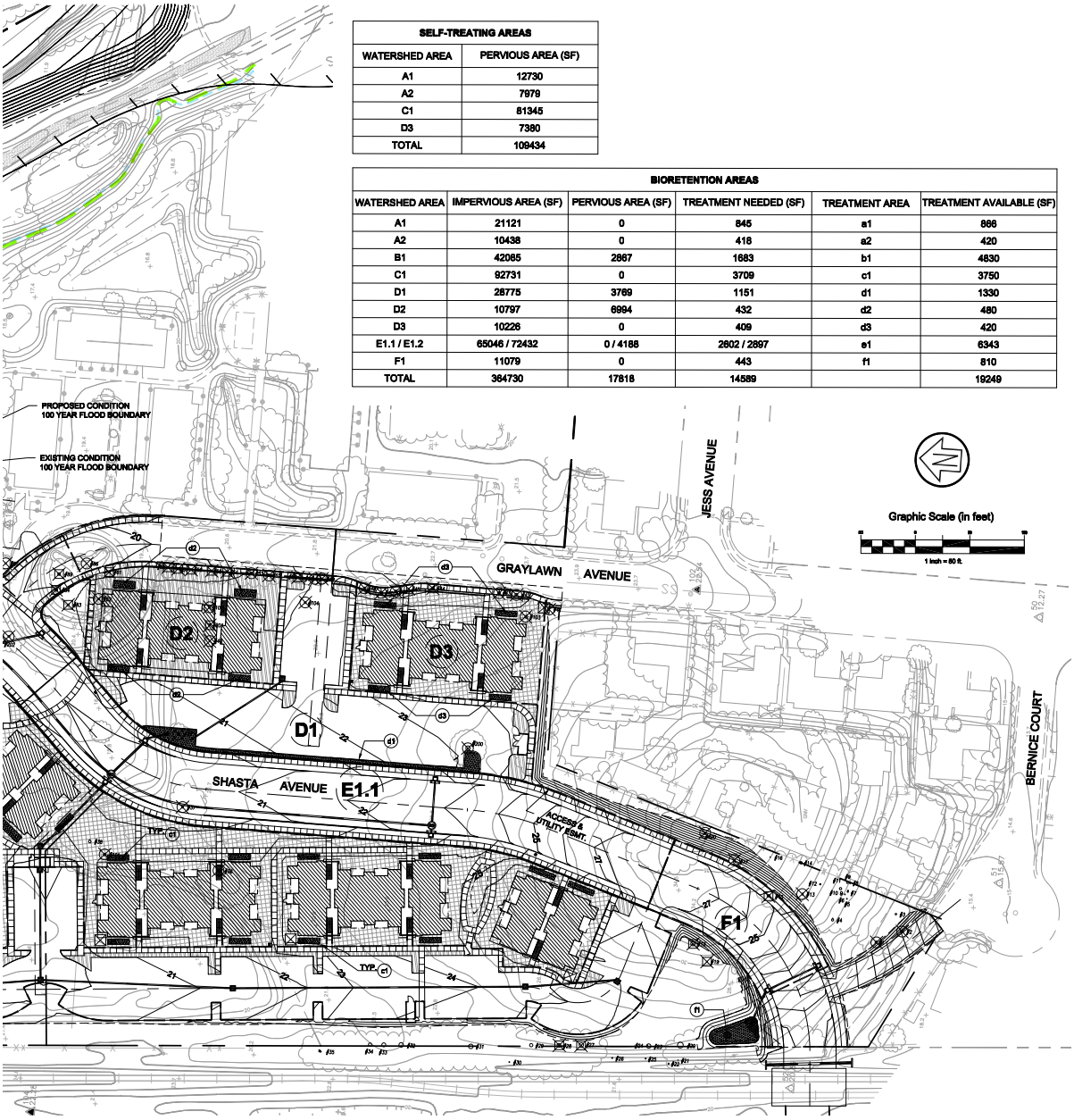


2 **BIORETENTION DETAIL**
SCALE: 1" = 1'

Figure 11.2
Preliminary Stormwater Control Plan

SELF-TREATING AREAS	
WATERSHED AREA	PERVIOUS AREA (SF)
A1	12730
A2	7979
C1	81345
D3	7380
TOTAL	109434

BIORETENTION AREAS					
WATERSHED AREA	IMPERVIOUS AREA (SF)	PERVIOUS AREA (SF)	TREATMENT NEEDED (SF)	TREATMENT AREA	TREATMENT AVAILABLE (SF)
A1	21121	0	845	a1	866
A2	10438	0	418	a2	420
B1	42065	2867	1683	b1	4830
C1	92731	0	3709	c1	3750
D1	28775	3769	1151	d1	1330
D2	10797	6994	432	d2	480
D3	10226	0	409	d3	420
E1.1 / E1.2	65046 / 72432	0 / 4188	2602 / 2897	e1	6343
F1	11079	0	443	f1	810
TOTAL	364730	17818	14589		19249



LEGEND

- BIORETENTION AREA (REFER TO DETAILS 1 & 2)
- SELF-TREATING AREAS (LANDSCAPED OR TURF AREAS)
- PERVIOUS AREA
- BMP IDENTIFICATION
- WATER SHED IDENTIFICATION
- WATERSHED AREA
- BMP — BEST MANAGEMENT PRACTICES

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Source: CSW/Stuber Stroeh Engineering Group, 5/01/2017

Final development plans will be required to submit a Final SWCP and detailed calculations to demonstrate that the requirements of post-construction runoff treatment have been met in accordance with requirements of the City's Storm Water Management regulations (Municipal Code Chapter 15.80 – Stormwater Management and Pollution Control). The City's Public Works and Utilities Department must approve the design of post-construction BMPs.

Mitigation Measures

In furtherance of the regulatory requirements identified above related to protection of water quality during Project Operations, the following additional mitigation measures are recommended to provide further detailed requirements to reduce and/or avoid adversely affecting water quality.

Mitigation Measure Hydro-2A: SWCP Implementation. The Project shall design, construct and implement appropriate post-construction stormwater treatment measures to reduce water quality and hydromodification impacts to downstream reaches, as required by the current post-construction control requirements of the Small MS4 General Permit. Upon completion of the final project design, the applicant shall provide documentation of stormwater management measures that show compliance with the Small MS4 General Permit.

a) The report shall delineate individual drainage management areas (DMAs) within the Project site, and provide analysis to show compliance with the volumetric or flow-based treatment criteria as described in the Small MS4 General Permit.

b) The Projects SWCP must provide the capacity to either infiltrate or evapotranspire all runoff generated by the 85th percentile storm event.

c) Treatment measures must be provided for runoff that cannot be diverted to the site's storm water system, using specified Best Management Practices able to remove or otherwise neutralize identified pollutants.

d) Water quality improvements shall not be placed so low in the floodplain that they are inundated by a 2-year storm.

Mitigation Measure Hydro-2B: SWCP Monitoring and Maintenance Agreement. Prior to public improvement plan approval, a mechanism shall be in place to ensure funding of on-going maintenance, inspection, and as needed repair of the Project SWCP, including the maintenance of the proposed Terracing Plan.

a) Maintenance requirements and frequency shall be carefully described including vector control, clearing of clogged or obstructed inlet or outlet structures, vegetation/landscape maintenance, replacement of media filters, regular sweeping of parking lots and other paved areas, etc.

b) Wastes removed from BMPs may be hazardous. Therefore, maintenance costs should be budgeted to include disposal at a proper site.

c) The monitoring and maintenance program shall be conducted at the frequency agreed upon by the RWQCB and/or City of Petaluma. Monitoring and maintenance shall be recorded and submitted annually to the SWRCB. The SWCP may be adjusted as necessary to address any inadequacies of the BMPs.

d) Provide maintenance funding in perpetuity for maintenance of all stormwater related improvements, subject to City approval. Funding mechanism shall be by taxation, not

subject to repeal through property owner or renter action.

e) The Project applicant shall prepare informational literature and guidance on residential development BMPs to minimize pollutant contributions from the proposed development. This information shall be distributed to all adult residents at the Project site. At a minimum, the information shall cover: a) proper disposal of commercial cleaning chemicals; b) proper use of landscaping chemicals; c) clean-up and appropriate disposal of hazardous materials and chemicals; and d) prohibition of any washing and dumping of materials and chemicals into storm drains.

f) The terraced flood plain shall be inspected at least annually, prior to the onset of the rainy season, by a Civil Engineer licensed to practice in the State of California, to ensure that the terracing is performing as designed and required in project approvals. The Civil Engineer shall prepare a signed and sealed report of the inspection including findings, photo documentation, any necessary proposed modifications and a statement indicating that the system is operating as designed and required by project approvals. The annual report shall be submitted to the City of Petaluma Planning Division and Department of Public Works and Utilities no later than October 15th of each year.

Resulting Level of Significance

As indicated above, the Project applicant will be required to obtain all required permits and authorizations from applicable regulatory agencies. BMP design elements shall demonstrate how the Project's post-construction runoff treatment has been designed in accordance with requirements of the City's Storm Water Management regulations (Municipal Code Chapter 15.80 – Stormwater Management and Pollution Control) and NPDES MS4 requirements. These regulatory requirements and Mitigation Measure Hydro-2A and -2B, when properly designed and implemented, can reduce effects on the quality of storm water runoff from the Project site during operation to less-than-significant levels.

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.

Development within the Floodplain

Hydro-3: The Project would not place any new housing or create any new habitable space on the first floor of a new building that is located within a regulated floodplain (i.e., within a 100-year flood hazard area as defined on applicable FEMA Flood Insurance Rate Maps). (**Less than Significant**)

According to FEMA Flood Insurance Rate Maps applicable to the Project site (FIRM Panels 894 and 982, FEMA, February 2014), portions of the Project site are located within the 100-year floodplain of the Petaluma River. The northern and western portions of the Project site that are within and immediately adjacent to the banks of the Petaluma River are within FEMA Special Flood Hazard Area AE, defined as the area subject to inundation by the 1% annual chance flood (100-year flood, or base flood).

Pursuant to City General Plan Policy 8-P-30, a more detailed floodplain delineation has also been established for the Project site, using the city's latest high-performance Storm Water Management Model (XP-SWMM). The floodplain delineation relying on the XP-SWMM hydraulic model uses site-specific data, including detailed water surface elevations from the FEMA Flood Insurance Survey (FIS)

and more detailed topographic data. In this case, the detailed XP-SWMM model and its 1-foot topographic survey for the Project site is superior to information used to generate the FEMA FIRM maps, and has been used for assessing potential impacts. Generally, the XP-SWMM model indicates that the base flood elevation at the Project site ranges from elevation 19.96 feet (NAVD88) at the lower reaches of the Project site, to 20.56 at the upper reaches adjacent to the Project site.

According to the XP-SWMM delineation, none of the Project's proposed new apartment structures are located within the 100-year floodplain of the Petaluma River (see **Figure 11-3**). Furthermore, new development has finished floor elevations of 21 feet nearest to the lower reaches of the river, and up to 24 feet at the upper reaches, above the base flood elevation by 1 foot or more in all cases. Additionally, the Project proposes a terraced grading plan along the westerly bank of the river, which would have the effect of further lowering the base flood elevations within the Project site (see additional discussion and analysis under Hydro-5, below), such that new buildings would be further elevated above the base flood elevation. The Project's proposed bio-retention areas, portions of the riverfront trail, sections of proposed new sidewalks, and the entire proposed terraced grading plan (see further discussion below) are located within the designated 100-year floodplain. However, the Project would not involve construction of habitable structures within a 100-year floodplain that would otherwise expose people or structures to a significant risk of loss, injury or death due to flooding. This impact would be less than significant.

Mitigation Measures

None needed.

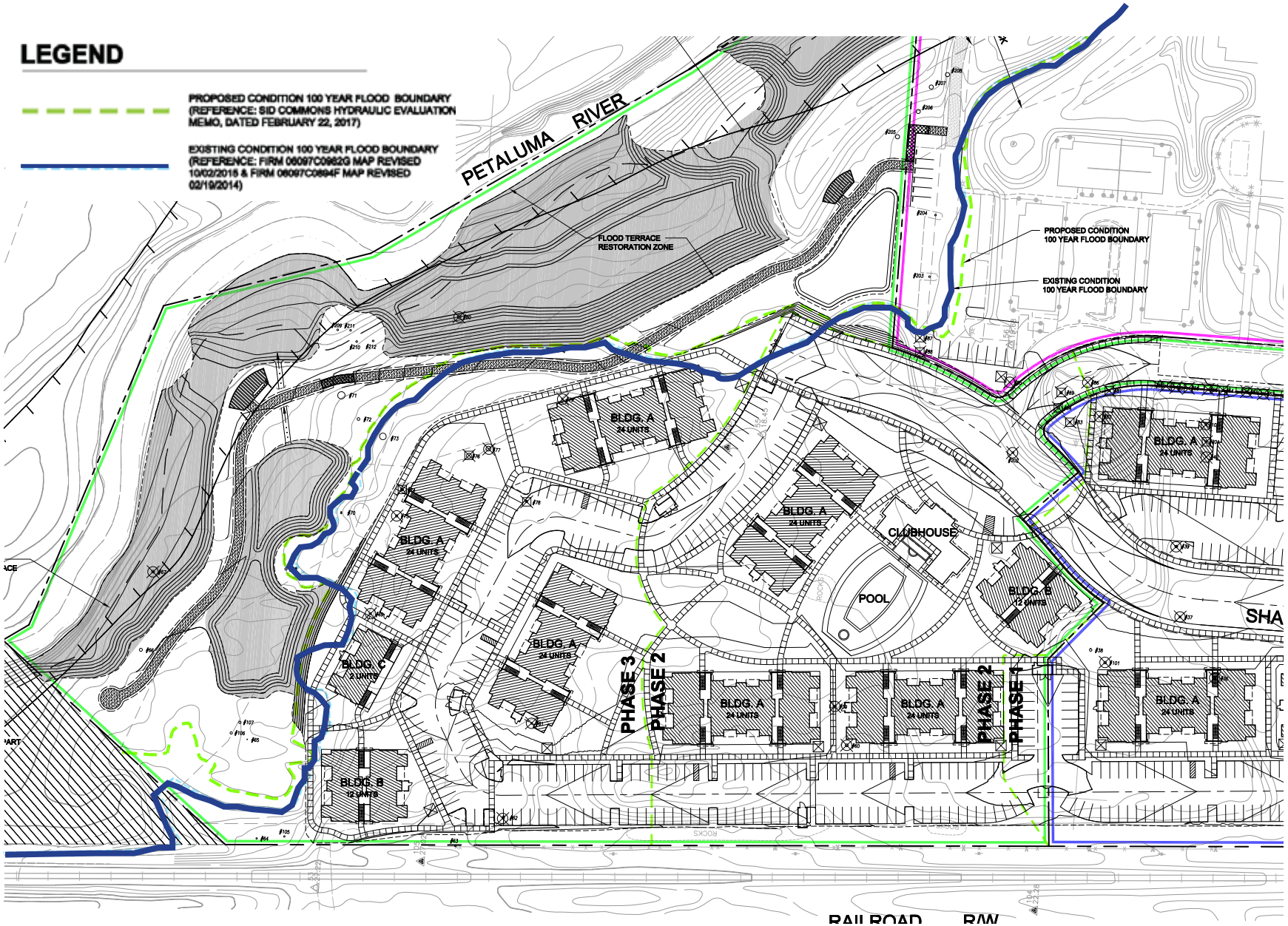


Figure 11-3
100-Year Floodplain Boundary, per City XP-SWMM Delineation

Source: CSW/Stuber Stroeh Engineering, 5/1/2017

Increased Stormwater Runoff

Hydro-4: The Project would not substantially increase the rate or amount of surface runoff in a manner that would result in flooding on- or off-site, nor would it create or contribute runoff water that would exceed the capacity of existing or planned stormwater drainage systems. (**Less than Significant**)

The Project site is underlain by low permeable soil formations (Yolo and Clear Lake clays). Despite the low permeability of existing soils, development of the site with new multi-family residential land use will result in approximately 8.4 acres of the site being developed with new impervious surfaces (see Table 11-2, above), which will result in increased surface runoff.

Given the Project's location within the Petaluma River watershed, existing runoff from the site leaves the site and passes downstream into the Petaluma River prior to the onset of larger peak flows generated further upstream in the watershed. Storing runoff on site would delay flows in such a way that they would coincide with peak flows from the upper watershed, which may increase flows and flood levels in the Petaluma River. Thus, projects in this area of the watershed, and that are immediately adjacent to the river and to areas of potential flooding, can reduce impacts by letting their runoff leave the site and enter the downstream drainages as quickly as possible.[5]

Conceptual Design Measures Included in the Project

The proposed Project does not propose storm water runoff detention. Only minor retention would be attained through the Project's proposed water quality basins and proposed vegetated swales. Thus, runoff from the site will enter the Petaluma River well in advance of when the peak flows from the upper watershed reach the site. Because the Project site is in the lower reaches of the Petaluma River watershed, stormwater flows exiting the Project site will have minimal effect on peak Petaluma River flows.

West Consultants utilized the City's latest XP-SWMM hydrology model to quantify potential increases in Petaluma River flows resulting from development of the Project (see further discussion under River Terracing, below). West modeled the Project (both its increased runoff resulting from new development, and the increased capacity of the Petaluma River based on the proposed terraced grading plan) under both 10-year and 100-year flood events. At the Project site, the reduction in water surface elevation for the terraces reaches averages 0.75 feet for the 10-year event and 0.3 feet for the 100-year event. Although terracing reduces the water surface elevation adjacent to and upstream of the project site, there is a minor increase in the Petaluma River peak discharge and water surface elevation downstream. The minor increase was previously document as part of the Denman Terracing Phase 3 study and is attributed to terracing upstream of Corona Road. Notably, the maximum increase in water surface elevation due to the proposed Sid Commons Terracing was found to be less than the increase calculated in the Denman Terracing Phase 3 Study. As such, the overall flooding impacts downstream (maximum water surface elevation) due to the Denman Phase 3 and proposed Sid Commons Terracing would be reduced relative to the previously approved Denman Phase 3 terracing project. The minor increase in 100-year storm flow or about 0.1 percent is within the limits of model tolerances and is not considered significant. Consequently, the impact of increased runoff from the site would be less than

[5] See also City of Petaluma, *Deer Creek Village Draft EIR, Initial Study*, page 37, March 2011

significant (see further discussion regarding effects on the floodplain boundary under river Terracing, below).

Mitigation Measures

None needed. The impact of increased runoff from the site under developed conditions would be less-than-significant and no additional mitigation measures are required.

River Terracing

Hydro-5: The Project's proposed riverbank terrace grading would not substantially alter the course of the Petaluma River in a manner that could cause increased risk or severity of on-site or off-site flooding. (**Less than Significant**)

As indicated in the Project Description (Chapter 3 of this DEIR), the Project's proposed terraced grading plan, which is required pursuant to City General Plan Policy 8-P-28 and -30, provides for re-grading the western bank of the Petaluma River within the Project site to improve flood capacity and flow efficiency. The terraced grading plan includes three separate areas: the lower reach terrace, the middle reach terrace, and the upper reach terrace.

- The lower reach is in the more southerly portion of the proposed River terrace, separated from the upstream reaches by an area of high priority native riparian vegetation. Grading for the lower reach is designed to avoid grading into high priority riparian areas and to avoid grading of upland wetlands.
- The middle reach is bound at the upstream end by a grove of trees and by the confluence of Deer Creek. Grading for the middle reach is designed to avoid impacting the grove of trees and to create a new wetland area on the terrace bench.
- The upper reach is bound by the northerly boundary of the property. Grading for the upper reach is designed to avoid impacting several oak trees, and includes the creation of two new wetland areas along the flatter upland floodplain.

Grading for each of the three terrace areas generally includes a gradual (5%) slope beginning at the low-flow channel of the River and rising between 5 to 10 feet in elevation, with a steeper banked (2:1) slope meeting existing grade at the upland portion of the site. In the lower reach, this steeper bank rises in elevation by as much as 10 feet, and in the upper reach, the steeper bank has only about a 4 to 5-foot rise. An 8-foot wide pedestrian and bicycle trail meanders along the top of the new River bank, and, as stated in the Project Description, will extend to both edges of the Project site boundaries, as well as connect to an existing river trail within the Oak Creek Apartments site. Bench seating and intermittent view opportunities would be provided along the multi-use trail.

The terraced grading plan for the Project would result in a net removal of approximately 21,140 cubic yards of soil from along the riverbanks, thereby expanding the channel capacity and lowering the base flood elevation.

Methodology

To assess the potential effects on the existing Petaluma River floodplain that would result from grading and terracing of the Petaluma River's westerly bank within the Project site, West Consultants used the City-approved 2010 XP-SWMM software. The proposed terraced reach is about halfway between the Petaluma Outlet Mall and Lynch Creek, and is located just downstream of the SMART Railroad crossing

extending to a point approximately 0.35 miles downstream. The hydrology evaluation is based on the XP-SWMM model that was used for 2012 FEMA Flood Insurance Rate Map revisions, and that prior model's assumptions regarding impervious surfaces were adjusted to account for Project buildout at year 2025.

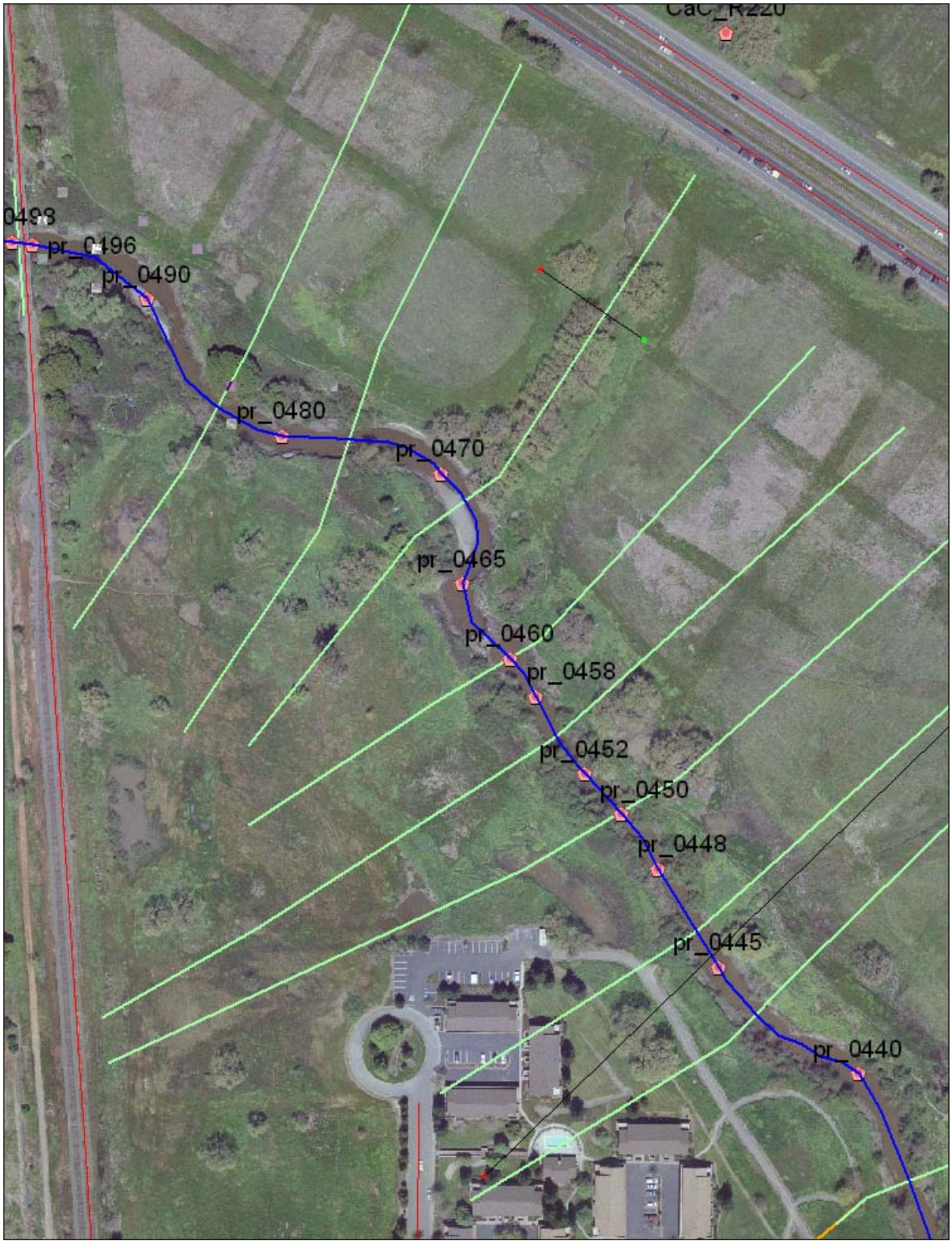
Cross sections near the Project were acquired for both with and without the proposed terracing conditions. The "without terracing" conditions reflect General Plan 2025 buildout conditions, and cross sections across the River reflect current topography in the Project area. For "with terraced grading" conditions, cross-sections reflect the Project's proposed floodplain terracing and Project grading. Both modeling scenarios ("without" and "with" terracing at the Project site) also presume cumulative buildout of the Petaluma General Plan 2025, including grading and development of the uplands portion of the Project as proposed. [6]

Cross-sections across the River and within the Project site are identified as "nodes" (nodes pr_0440 through pr_0490) within the XP-SWMM hydrology model. Node locations and approximate cross section locations are illustrated in **Figure 11-4**.

Changes in the Water Surface Elevations

Both the 10-year and 100-year rainfall events were used to evaluate the effectiveness of the Project's proposed terraced grading. The percent of impervious surface within the watershed (including increased impervious surfaces associated with the Project) was based on General Plan buildout year 2025 conditions for model runs with and without the Project's proposed terraced grading, consistent with the data utilized for the hydraulic evaluation included in the City's General Plan 2025 EIR. A comparison of model results under the 10-year and 100-year events for both with, and without the Project's proposed terraced grading is provided in **Table 11-3** and **Table 11-4.**

[6] The Project's proposed floodplain terracing and project grading were provided by CSW/Stuber-Stroeh Engineering Group, Inc.



Source: West Consultants, 2/22/17

Figure 11-4
XP-SWMM Node and Cross Section Locations, at Project Site

Table 11-3: Changes in the 10-Year Water Surface Elevations near the Project Site Due to On-Site Terraced Grading (feet, NAVD88)

Node	Buildout with Project, but without Terraced Grading	Buildout with Project and with Terraced Grading	Change
Upstream of Project Site:			
Pr_0590	25.14	25.14	0.00
Pr_0580	24.17	24.18	0.02
Pr_0552	21.57	21.36	-0.20
Pr_0550	21.02	21.80	-0.22
Pr_0540	20.21	19.80	-0.41
Pr_0530	19.78	19.37	-0.42
Pr_0520	19.34	18.81	-0.54
Pr_0510	19.04	18.41	-0.63
Pr_0500	18.97	18.32	-0.65
pr_0498	18.43	17.63	-0.80
pr_0496	18.21	17.17	-1.03
Within the Project Site:			
pr_0490	17.70	16.68	-1.02
pr_0480	17.44	16.42	-1.02
pr_0470	17.29	16.19	-1.10
pr_0465	17.07	16.12	-0.94
pr_0460	16.95	16.09	-0.86
pr_0458	16.66	15.98	-0.68
pr_0452	16.51	15.87	-0.64
pr_0450	16.30	15.71	-0.59
pr_0448	16.05	15.50	-0.55
pr_0445	15.17	15.12	-0.05
pr_0440	13.72	13.69	-0.03
Downstream of Project Site:			
Pr_0430	13.54	13.50	-0.03
Pr_0410	13.29	13.25	-0.04
Pr_0400	13.09	13.05	-0.04
Pr_0390	12.23	12.21	-0.02
Pr-0380	11.72	11.73	0.01
Pr-0370	11.05	11.06	0.01

Source: West Consulting, February 22, 2017

The corresponding model node and cross section locations within the Project site are shown in Figure 11-4.

Table 11-4: Changes in the 100-Year Water Surface Elevations near the Project Site due to On-Site Terraced Grading (feet, NAVD88)

Node	Buildout with Project, but without Terraced Grading	Buildout with Project and with Terraced Grading	Change
Upstream of Project Site:			
Pr_0590	26.45	26.42	-0.03
Pr_0580	25.94	25.88	-0.05
Pr_0552	25.15	25.06	-0.09
Pr_0550	24.04	23.93	-0.12
Pr_0540	23.46	23.31	-0.15
Pr_0530	22.76	22.51	-0.24
Pr_0520	22.27	21.91	-0.36
Pr_0510	22.02	21.62	-0.41
Pr_0500	21.93	21.52	-0.42
pr_0498	21.06	20.52	-0.54
pr_0496	20.94	20.36	-0.58
Within the Project Site:			
pr_0490	20.56	19.96	-0.60
pr_0480	20.28	19.77	-0.51
pr_0470	20.19	19.66	-0.52
pr_0465	20.02	19.61	-0.42
pr_0460	19.94	19.57	-0.36
pr_0458	19.73	19.49	-0.24
pr_0452	19.65	19.44	-0.21
pr_0450	19.64	19.37	-0.17
pr_0448	19.41	19.27	-0.14
pr_0445	19.05	19.06	-0.01
pr_0440	17.35	17.37	-0.02
Downstream of Project Site:			
Pr_0430	17.11	17.13	0.02
Pr_0410	16.97	16.81	0.02
Pr_0400	16.58	16.58	0.02
Pr_0390	15.67	15.70	0.03
Pr-0380	15.05	15.08	0.03
Pr-0370	14.22	14.25	0.03

Source: West Consulting, February 22, 2017

The corresponding model node and cross section locations within the Project site are shown in Figure 11-4.

The model results indicate that the Project's proposed terraced grading within the floodplain will provide for a reduction in water surface elevation within the reach of the river fronting onto the Project site and, to a lesser extent, the reach of the river immediately upstream of the Project. The water surface elevation along the terraced reach within the Project site (between nodes pr_0440 and pr_0490) averages a reduction of 0.75 feet for the 10-year event, and 0.3 feet for the 100-year event. A maximum reduction in water surface of 1.1 feet occurs at node pr_0470 under the 10-year event, and 0.6 feet at node pr_0490 under the 100-year event. Although the Project's proposed terraced grading reduces water surface elevations adjacent to the Project site, it does result in a minor increase in peak flow (or discharge) and water surface elevations downstream of the terraced reach. [7]

The downstream discharge and increase in water surface elevation caused by the Project's proposed terracing appears to be due to changes in flood flow velocity (primarily slower, but also faster in several reaches), which results in slightly higher peak flows downstream. Another potential factor is the result of lower water surface elevations due to the terracing, which results in less water storage in the overbanks upstream in the Willow Brook Creek area, and therefore slightly higher peak flows downstream.

Changes to the Floodplain

As part of West's analysis, the XP-SWMM also provides for modeling the effects of the Project's proposed terraced grading on the boundaries of the base floodplain:

- As shown on **Figure 11-5**, the 100-year floodplain boundary within the Project site would be marginally reduced along this full reach of the River; and at reaches of the river immediately upstream of the Project and its terraced grading (from the Project boundaries to the Petaluma Outlet Mall), the 100-year floodplain boundary would also be marginally reduced as compared to the current floodplain;
- As shown on **Figure 11-6**, the slight increase in projected water surface elevations at downstream reaches of the River would result in virtually no addition to the current floodplain boundaries.

An additional evaluation was conducted to consider the effects of both the approved Denman Phase 3 terracing project, and the Project's proposed terracing. This evaluation found maximum water surface elevations to be lower than those elevations previously reported for the 2012 Denman Phase 3 terracing project evaluation (except for at one area of the Denman reach where the amount of Denman Phase 3 terracing was reduced in the final design concept). The results of this combined evaluation indicate that the resulting overall flooding impacts (i.e. maximum water surface elevation) with both the Denman terracing and the Project's terracing projects in flood-prone areas (such as C Street and 1st Street) would be lower than previously identified in the 2012 Denman Phase 3 terracing project. Therefore, impacts due to a change in the surface flood elevation as result of the proposed Sid Commons Terracing would be less than significant.

[7] This minor downstream increase was no greater than the minor downstream increase previously documented as part of the Denman Terracing Phase 3 study, which evaluated terracing upstream of Corona Road and which was approved by the City in 2012 .

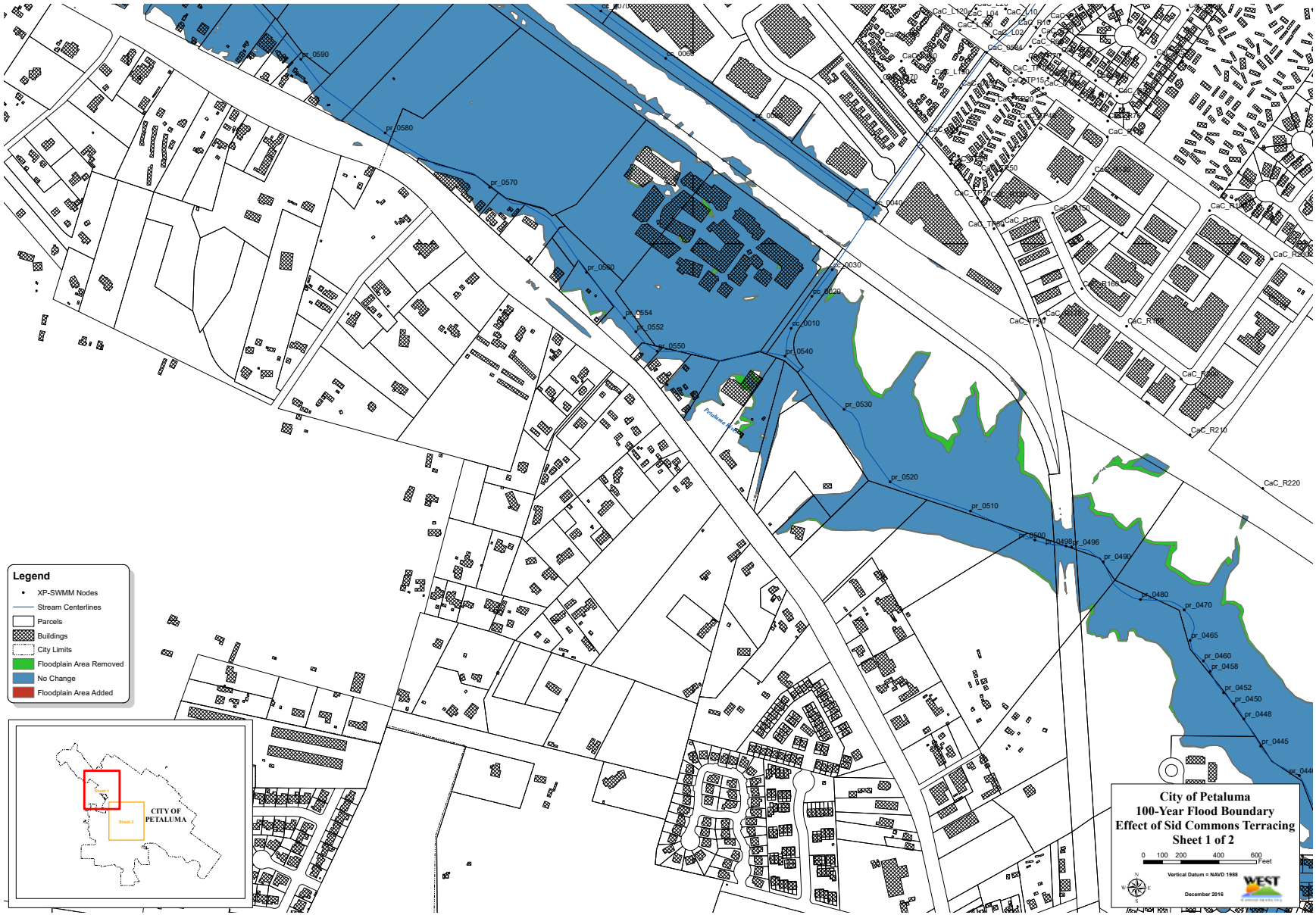


Figure 11-5
Effects of Project Terracing on Floodplain Boundary, Upstream

West Consultants, 2/27/17

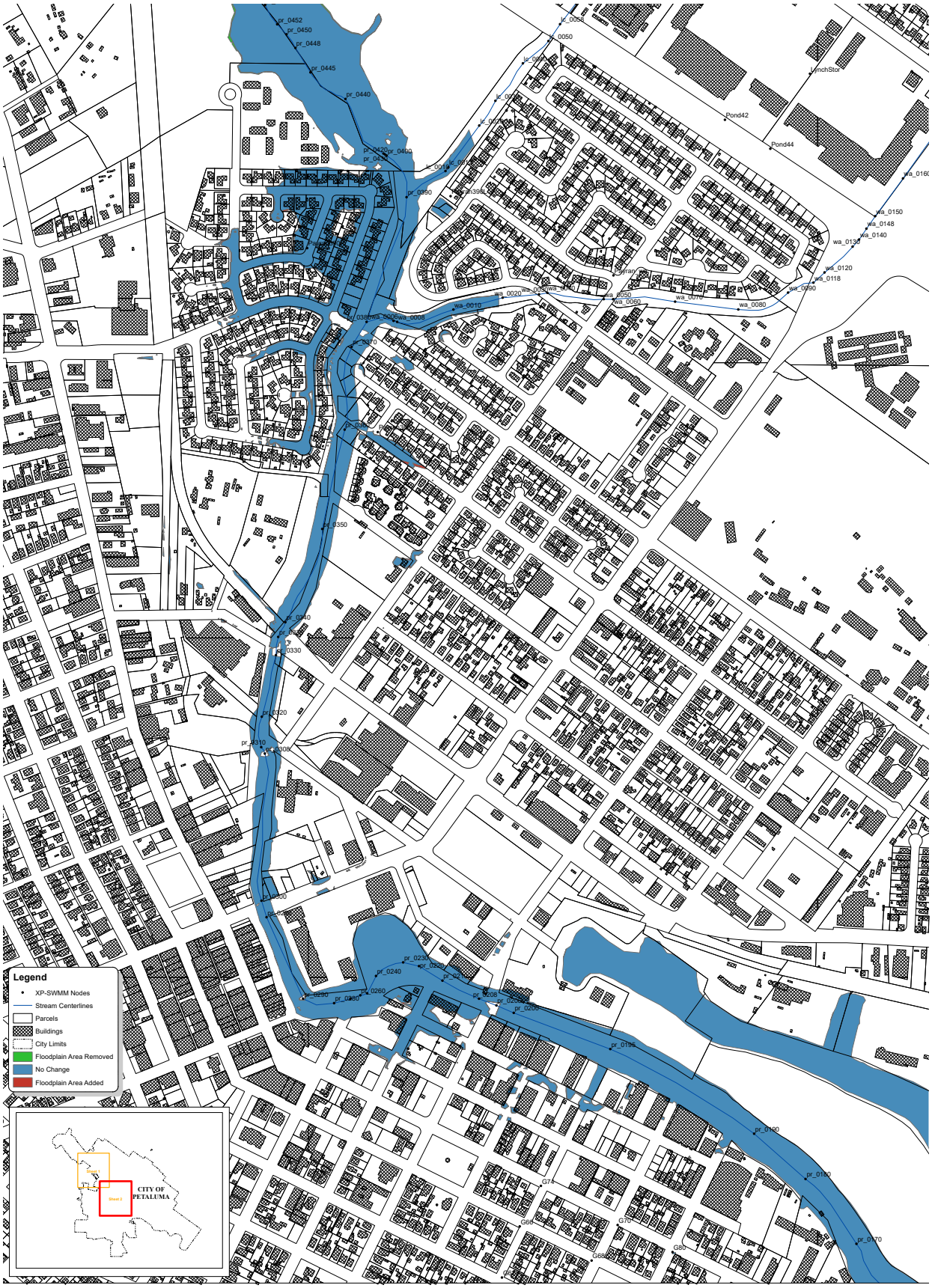


Figure 11-6
Effects of Project Terracing on Floodplain Boundary, Downstream

West Consultants, 2/27/17

Mitigation Measures

None required. The Project's proposed terraced grading plan (required pursuant to City General Plan Policy 8-P-28 and 30) is included as part of the Project to address City-wide hydrological concerns. As shown through detailed and site specific hydrological modeling, modification to the southwestern bank of the Petaluma River via terracing would result in minor increases in water surface elevation during peak 100-year flood conditions downstream of the terraced reach by up to an average of 0.03 feet (1/3 inch), which is within the modeling accuracy tolerances, and would result in negligible changes to the floodplain boundary. In addition, the Project's terracing plan, taken together with the Denman Terracing Phase 3 project, results in a smaller increase in water surface elevation than the City Council authorized in approving the Denman Terracing Phase 3 Project.[8] Therefore, no mitigation is required as impacts are below levels of significance.

Groundwater Depletion/ Recharge

Hydro-6: The proposed Project will not draw upon or otherwise reduce groundwater resources. (**Less than Significant**)

The entire 19.23 gross acres of the Project site is currently undeveloped (except for the 0.52 acres of the Graylawn turnaround, which is developed as open space and roadway) and provides pervious infiltration of rainwater. Post development, approximately 8.4 acres (or approximately 69 percent of the Project's proposed development site) would be covered in impervious surfaces such as roofs and pavement. Pre- and post-development impervious and pervious surfaces are presented in Table 11-2 above. Development of the site as proposed would increase impervious surfaces within the groundwater basin, and to a limited extent reduce stormwater infiltration into the groundwater

However, the proposed development portion of the Project site is overlain by Yolo and Clear Lake clays (see also Chapter 5: Geology) which have low permeability, and it is unlikely that the proposed development portion of the site provides extensive groundwater recharge to the Petaluma Groundwater Basin. Rather, the adjacent Petaluma River provides extensive groundwater recharge. The River and its associated floodway and floodplain (including the proposed terraces area) will remain as open, impervious surface (other than a multi-use trail along the top of bank) pursuant to the Project. The proposed terracing along the southwest bank of the River will result in an expanded area of potential infiltration relative to the existing channel width. Thus, the project supports General Plan policy 9-P-20 to enhance groundwater recharge opportunities.

The Project does not intend to utilize groundwater as a source of water supply, and instead will obtain its water from City of Petaluma municipal sources. The City sometimes withdraws water from the local groundwater basin, but none of the City's groundwater wells are located at the Project site. Additionally, the Project will utilize high efficiency appliances, faucets and fixtures that minimize indoor water demands and will include the installation of smart irrigation controls and water efficient landscaping, which will further reduce the overall water consumption of the project.

[8] WEST Consultants, Inc., Phase 3 Denman Reach Terracing Hydraulic Evaluation, March 18, 2015

Mitigation Measures

The Project is expected to have a less than significant impact on groundwater resources, and no mitigation is required.

Inundation by Seiche, Tsunami or Mudflow

Hydro-7: The Project site is not located in an area that would expose persons to inundation by seiche, tsunami, or mudflow. The Project site is nearly level and is not in proximity to any large lake or the ocean. (**Less than Significant**)

A seiche is a tide-like rise and drop of the surface of a landlocked body of water (e.g., a lake). Its period can vary from a few minutes to several hours. The Project site is not located near a landlocked body of water that could cause inundation by seiche.

Tsunamis, or tidal waves, are huge sea waves that are caused by seismic activity or other disturbance of the ocean floor. Although seismically induced waves are a possibility in San Francisco Bay, the Project site elevations are above those considered to be at risk for tsunami wave run-up. Wave run up is estimated at 6 feet above mean sea level for a 500-year tsunami. Therefore, the site is not at risk for inundation by tsunami.

Cumulative Hydrology Impacts

Hydro-8: The Project and other cumulative projects in Petaluma are required to comply with City ordinances and General Plan 2025 policies pertaining to drainage, grading and flood control management intended to control runoff and regulate water quality at each development site. All new cumulative projects would be required to demonstrate that stormwater volumes could be managed by flood control facilities and would not induce flooding or would not significantly reduce the effectiveness of those facilities. With implementation of all applicable regulatory requirements and applicable flood control/floodplain management policies, the effect of the Project, in combination with other cumulative development in the watershed, would be less than cumulatively significant.

Cumulative development pursuant to buildout of the City of Petaluma General Plan may increase drainage flows because of impervious surfaces, thereby altering existing drainage patterns. Future cumulative development will result in construction of structures on lands that are currently vacant. New streets, parking lots and rooftops will prevent natural drainage and infiltration of storm water through the soil, and surface water runoff volumes and rates generated from undeveloped, unpaved areas will increase significantly when that site is paved and the capacity for surface water infiltration is reduced or eliminated.

The City of Petaluma General Plan EIR (page 3.6-8) evaluated the flooding impacts of cumulative development using the City's XP-SWMM computer model, which was calibrated to the New Year's Flood of December 30-31, 2005 based on stream gage data and a map depicting the approximate limits of flooding during that New Year's Flood. The General Plan EIR analysis concluded that flooding impacts under a 100-year storm are virtually identical for both existing condition and cumulative buildout conditions. This is attributed to the saturated conditions that existed prior to the New Year's Flood. Increasing the impervious percentage of affected sub-basins to reflect the General Plan buildout did not significantly increase the size of the floodplain, because the runoff at the peak of the 100-year storm

was already characteristic of a highly impervious surface. This storm analysis presents a worst-case scenario.

During the New Year's Flood of December 2005, significant flooding was experienced in Petaluma, particularly in the middle and northern areas of town. It is estimated that approximately 53 structures, not including mobile home parks, were damaged by floodwaters, there was damage to local streets and river channel banks, and the greatest damage was within the Petaluma Factory Outlets, commercial structures and three of the City's mobile home parks. The Payran reach was not as adversely affected by this flood, attributable to the majority of the Petaluma River Flood Control Project being in place at the time. The flooding event was declared a State and federal disaster.

To reduce the potential for reoccurrence of this flood condition in the future, the City has adopted ordinances and General Plan policies that seek to reduce flooding and floodplain effect to the greatest extent feasible. Generally, these ordinances and policies provide for the following flood control and management provisions applicable to all cumulative development projects, as applicable:

1. No additional development shall be permitted on lands within a 200' setback from centerline of the Petaluma River within the City's Urban Growth Boundary. These affected lands are to set aside necessary river corridor areas and, as development occurs, shall undertake surface water containment improvements (GP Policy 8-P-30);
2. Properties located upstream of the Corps weir and below the confluence of Willow Brook Creek with the Petaluma River, and that are located within the floodplain, shall include a Petaluma River Corridor (PRC) set aside for the design and construction of a flood terrace system to allow the River to accommodate a 100-year storm event within a modified River channel (GP Policy 8-P-28);
3. Properties within the Petaluma watershed and outside of the City of Petaluma, which are subject to periodic surface water inundation and containment, should not be modified in any manner that reduces stormwater storage capacity, and all responsible public agencies shall work to preserve and expand detention basin capacity within the Petaluma River watershed to maintain or reduce peak discharge volumes (Policy 8-P-32);
4. New development within the regulatory floodplain of the Petaluma River watershed shall adhere to a zero-net fill policy to preserve and enhance basin capacity and to ensure no detrimental impact to downstream flows, including the increase in peak discharge volumes in the downstream areas.
5. Where appropriate, new development shall implement zero-net runoff, and assess site-specific impacts and identification of mitigations (Policy 8-P-33).

Relative Beneficial Effects of Floodplain Management Policies

At the request of the City, WEST Consultants conducted a cumulative analysis to evaluate the relative benefits of cumulative implementation of increased stormwater detention, cumulatively contemplated river terracing, and the combination of cumulative detention and terracing along the River (as directed by GP Policies 8-P-28 and 32). This evaluation (see **Appendix 11B**) is based on the same hydrology model used for the 2012 FEMA map revision submittal, and the assumptions for cumulative increase in percent impervious cover were adjusted for buildout (year 2025) conditions, as described above. Effects of detention and terracing were evaluated for the 10-year and 100-year flood events.

Three separate cumulative modeling scenarios were prepared, comprising: 1) cumulative up-stream detention only, 2) cumulative terracing only, and 3) cumulative up-stream detention and terracing

combined. Three sub-alternatives for the cumulative terracing scenarios were also considered: terracing of all River reaches, terracing only upstream of the Petaluma Outlet Mall (node pr_0554), and terracing only upstream of Corona Road. Simulations were prepared to compare the results against "baseline" conditions (cumulative buildout conditions without terracing or detention). Based on this analysis, the following trends are evident:[9]

- The alternative with the best ranking and largest reduction in water surface elevation for all reaches of the Petaluma River is upstream detention, with terracing in all reaches.
- In general, terracing results in locally significant reductions in water surface elevations, but also tends to increase the water surface elevation downstream of the terraced reach by a small amount. The small increase in downstream water surface elevation is due to an increase in peak flow, because less water is stored in the otherwise-flooded overbank areas, and the channel provides less flow attenuation.
- The reduction in water surface elevation at any given reach has the same general trends for both the 10-year and 100-year event, as well as for base or FEMA water surface elevations.
- Comparisons for the 100-year event show that the combined detention and terracing alternative results in lower water surface elevations than base (or FEMA) conditions for all reaches of the Petaluma River. However, for the 10-year event with both terracing and detention, the results show slightly higher increase in water surface elevations from downstream of the Sid Commons Project site to D Street in downtown Petaluma as compared to base conditions.[10]
- Detention alone results in lowering of water surface elevations as compared to the base (or FEMA) conditions for all reaches of the Petaluma River. However, the reduction in water surface elevations is much less, in some cases more than 1.5 feet less, than the results with both detention and terracing.

The resulting flood boundary for the 100-year event, under the scenario with cumulative upstream detention and terracing in all reaches is shown on **Figure 11-7, 11-8 and 11-9 (**simulated floodplain boundaries for all modelled scenarios are shown in **Appendix 11A**). The comparisons are relative to base conditions (or buildout conditions without detention/terracing), and show areas that would receive both reductions and increases to the floodplain boundary. **Table 11-5** summarizes the reductions and increases in the extent of the flood boundary for the 100-year flood event under each of the modeled detention and terracing scenarios.

[9] West Consulting, Detention and Terracing Evaluation, December 22, 2016 (Appendix 11B), pages 2 and 3

[10] Ibid, Table 1, nodes 0208 through 0440

Figure 11-7
Cumulative Effects of Detention and Terracing on Floodplain Boundary, Upper River

West Consultants, 2/10/2017

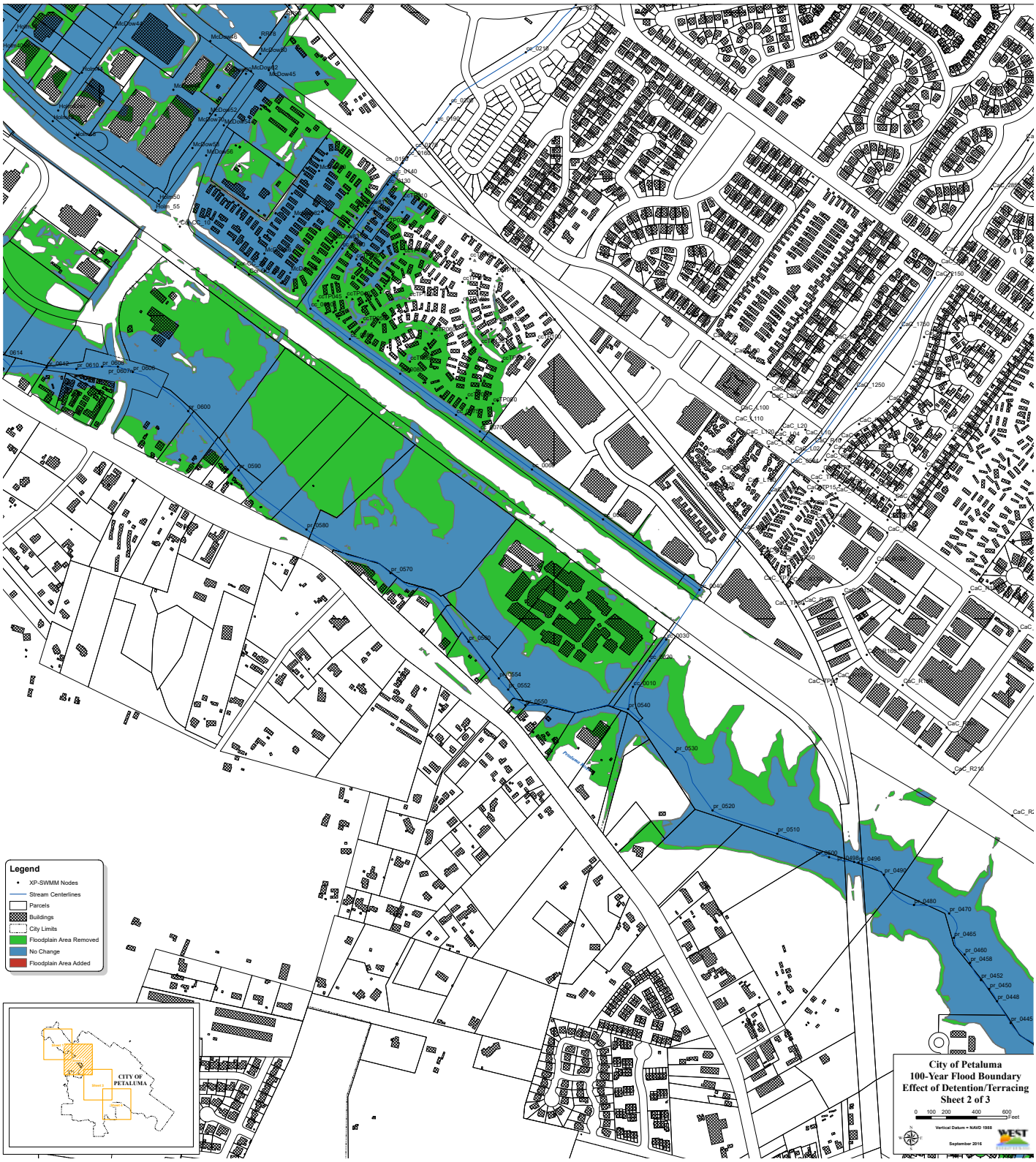


Figure 11-8
Cumulative Effects of Detention and Terracing on Floodplain Boundary, Mid River

West Consultants, 2/10/2017

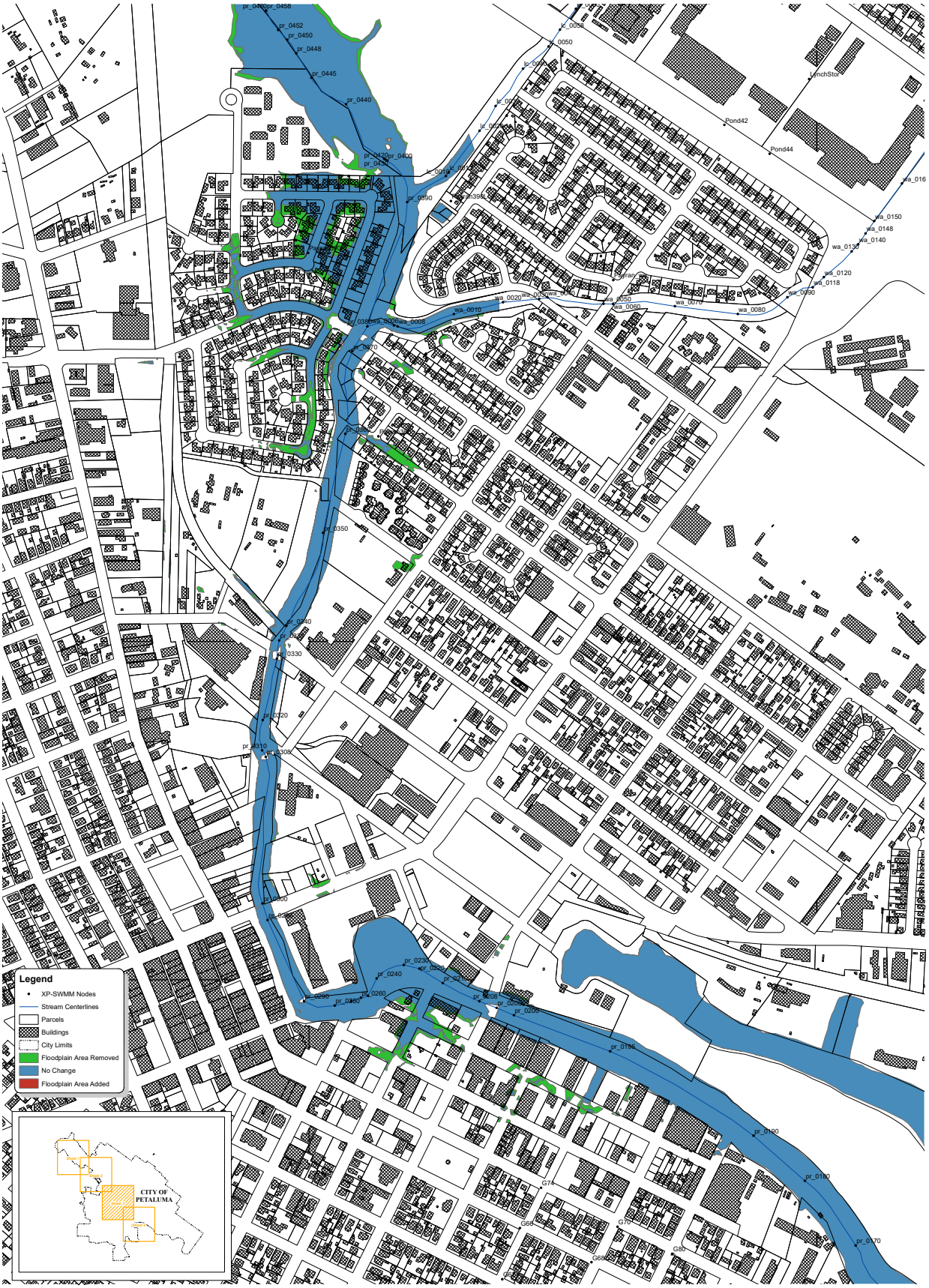


Figure 11-9
Cumulative Effects of Detention and Terracing on Floodplain Boundary, Lower River

West Consultants, 2/10/2017

Table 11-5: Percent Increase and Reduction of Floodplain Area, by Scenario

	Change in 100-Year Flood Boundary Extent from Base			
	Increase [2]		Decrease [2]	
	%	Area (acres)	%	Area (acres)
Terracing Only	0.7%	4.9	8.3%	60.0
Detention Only	0.1%	0.8	19.5%	140.9
Terracing upstream of Mall (only), and Detention	0.1%	0.9	23.3%	168.3
Terracing and Detention	0.1%	0.9	25.3%	182.9

Notes:

1. Comparison is based on visible area shown on Figure 11-8 (per Appendix 11A)

2. "Increase" from Base condition means additional flooding (red polygons of flood boundary graphics); "decrease" means a reduction (green polygons)

Based on a review of Table 11-5 and changes to the floodplain boundary presented in Figures 11-7 through 11-9, the alternative that combines upstream detention with terracing in all reaches represents the most significant reduction in water surface elevation, showing a reduction in the Petaluma River floodplain boundary (a net reduction of approximately 183 acres) as compared to base and FEMA floodplain boundaries.

Terracing without upstream detention is not recommended due to identified increases in water surface elevation downstream of the constriction weir, as well as a few reaches upstream of the weir. The scenarios with detention and limited terracing (either only upstream of Corona Road, or only upstream of the Outlet Mall) are also not preferred because of the significant advantage achieved by terracing the entire reach upstream of the constriction weir. Abandoning the terracing concept is also not recommended due to the substantial flood reduction that terracing achieves in key areas such as the Industrial Avenue corridor, Corona and Capri Creek housing areas, and at the Outlet Mall.

Conclusions

This analysis concludes that significant reductions in water surface elevations throughout the Petaluma River (as compared to base or FEMA water surface elevations) can be achieved if all future cumulative development within the City and subject to General Plan polices were to implement policy and ordinance requirements for: a) development setbacks from centerline of the Petaluma River; b) construction of flood terrace systems; c) preservation and expansion of detention basin capacity; and d) achieving a zero-net increase in peak discharge volumes. The Project and other cumulative projects in Petaluma would be required to comply with City ordinances and General Plan 2025 policies pertaining to drainage, grading and flood control management intended to control runoff and regulate water quality at each development site. All new cumulative projects would be required to demonstrate that stormwater volumes could be managed by flood control facilities and would not induce flooding or would not significantly reduce the effectiveness of those facilities.

The Project contributes to these cumulative floodplain management objectives, and is consistent with General Plan policy. It establishes a greater-than 200-foot development setbacks from the centerline of

the Petaluma River, it includes construction of a flood terrace, and it does not substantially increase peak discharge volumes to the River. As such, the Project contributes to cumulative reductions in flood water surface elevations throughout the Petaluma River as compared to base or FEMA water surface elevations, under the assumption that cumulative conditions (or full buildout) will provide for up-stream detention and that river terracing will also occur along all identified reaches of the river. Therefore, the Project's effects pertaining to flooding and floodplain management, in combination with other cumulative development in the watershed, would be less than significant.

As indicated in Table 11-5, the full beneficial effects of lowering water surface elevations and removing properties from the 100-year flood boundary are achieved with a combination of cumulative upstream detention and cumulative downstream river terracing. The Project site is in the downstream segment of the river, and can only implement the river terracing component of this scenario. As also indicated in Table 11-5 under the Terracing Only scenario, if upstream detention cannot be achieved and terracing is implemented in downstream segments (such as at the Project site) only 60 acres of property are shown to be removed from the 100-year flood boundary (or approximately one-third of the full benefits of the Terracing and Detention scenario), but nearly 5 acres of other properties would be added to the 100-year flood boundary.

Sea Level Rise

Hydro-9: Sea Level Rise: Future structures at the Project site would not be subject to hazards associated with increased flooding of the Petaluma River due to sea level rise. (**Less than Significant**)

Sea level rise is not uniform and is largely dependent on factors such as atmospheric and oceanic circulation, tectonics, and gravitational/ deformational effects generated by land mass changes. Sea level rise will most directly affect areas that are on the coast. The magnitude of estimated sea level rise varies by sources and study methods.

The San Francisco Bay Conservation and Development Commission (BCDC) has developed sea level rise projections based on 16 inches of sea level rise by mid-century (year 2050), and 55 inches of sea level rise at the end of the century (year 2100). BCDC generally suggests that the anticipated sea level rise largely correspond with today's 100-year flood zone. Meaning that, under the reasonably foreseeable expectation of sea level rise, the current 100-year flood zone would be subject to flooding not just during a 100-year flood event, but also during high tide.

The National Research Council (NRC) addresses planning for future sea level rise, including estimates of a range of likely amounts of sea level rise in the years 2030, 2050, and 2100. The 2010 report prepared by the NRC (*Sea-Level Rise for the Coasts of California, Oregon, and Washington: Past, Present and Future*) estimates sea level rise south of Cape Mendocino at approximately 1.6 to 11.8 inches by 2030; at 4.7 to 24 inches by 2050, and at 16.5 to 65.7 inches by year 2100. The U.S. Geological Survey (USGS) recently assessed statewide marsh accretion and plant community changes through the year 2100 at 12 tidal salt marshes around San Francisco Bay estuary, using a sea-level rise response model. This study included the Petaluma River Marsh, located approximately 6 miles downriver of the Project site. The USGS study reports show that 96% of its study area would become mudflats by year 2100, assuming a 48-inch rise in sea-level by year 2100.

As a tidally influenced river, the Petaluma River will be affected by sea level rise. As shown on **Figure 11-10**, an assumed high-level sea rise scenario of up to 5.7 feet (175 cm), coupled with an extreme high tide, a 100-year storm event, and waves, would result in elevated River levels and out-of-bank flooding.

Figure 11-10
Potential Effects of Sea Level Rise

Source: http://data.pointblue.org/apps/ocof/cms/index.php?page=flood-map

Under such a scenario, the influence of sea level rise on the Petaluma River is expected to extend north of the East Washington Bridge to near Madison Street, approximately one mile south of the Project location.[11] This level of sea level rise is not expected to occur until year 2100 and is considered speculative, as sea level rise conditions this far into the future cannot be presumed with a high level of confidence.

Although the Project site is located adjacent to the Petaluma River, the location's elevation is high enough in the watershed that it will not be significantly impacted by flooding events related to sea level rise. Therefore, sea level rise would have a less than significant impact on the Project site.

[11] Our Coast Our Future. "Interactive Map Tool." Online at: http://data.prbo.org/apps/ocof/index.php?page=flood-map

12

Land Use and Planning

This chapter evaluates the relationship of the proposed Project to the applicable land use plans and policies of the City of Petaluma and other agencies with jurisdiction over the site. As stated in Section 15358(b) of the CEQA Guidelines, "[e]ffects analyzed under CEQA must be related to a physical change." Further, Appendix G of the Guidelines (Environmental Checklist Form) makes explicit the focus on environmental policies and plans, asking if the Project would "conflict with any applicable land use plan, policy, or regulation . . . adopted for the purpose of avoiding or mitigating an environmental effect" (emphasis added). Even when a conflict is identified, it does not necessarily indicate the Project would have a significant effect unless an adverse physical change would occur. The assessment below forms the basis for determining consistency with applicable plans, policies and programs.

The "Setting" section of this Chapter provides a description of the existing land uses on and around the Project site and establishes the context of the relevant policies established in the Petaluma General Plan 2025 (2008), Implementing Zoning Ordinance (2008), Petaluma River Access and Enhancement Plan (adopted in May 1996), and the Petaluma Bicycle and Pedestrian Plan (2008).

The "Impact Analysis" summarizes the Project's relative conformance to all of the applicable plans and policies, and identifies modifications to the Project that would address potential policy conflicts.

Setting

The City of Petaluma is located within Sonoma County near the headwaters of the Petaluma River. The City form is contained within the Urban Growth Boundary (UGB), which includes the Petaluma River Valley Floor. The limit of the UGB was adopted in 1998 as part of Measure I and extends through 2025. The foothills and mountains that flank the perimeter of the City are located within Sonoma County and outside of the UGB. U.S. Highway 101 extends roughly southeast to northwest through the City, and is more or less paralleled by the SMART rail corridor and the Petaluma River.

The City of Petaluma's land uses are dominated by residential development. Within the UGB 44 percent of all land is devoted to residential uses, with 40 percent consisting of single-family residential neighborhoods[1].

Non-residential land uses are scattered throughout the City, with a concentration of commercial, industrial and warehouse along the Petaluma River Corridor. Larger retail centers are concentration along the Highway 101 corridor. Within the UGB land uses for industrial, commercial and institutional consist of 6, 8 and 10 percent of all designated land uses respectively. Public land and open space land consists of 16 and 18 percent, respectively.

[1] GP DEIR Land Use Chapter Table 3.1-1.

Existing and Adjacent Land Uses, General Plan and Zoning

The Project site is currently vacant. It gently slopes from the southwest to the top bank of the Petaluma River on the east. For the most part, the site is open and covered by grass, shrubs, and trees. Approximately 103 trees have been identified on or overhanging the Project site, including mature oaks and redwood trees. Portions of the Project site proximate to the Petaluma River lie within the 100-year floodplain.

The Project site is situated directly northwest of the existing Oak Creek Apartments at the northern terminus of Graylawn Avenue (see **Figure 12-1**). The Petaluma River forms the eastern boundary and the SMART tracks form the western boundary. The Linda del Mar subdivision of the Payran neighborhood lies to the south of the site. Across the Petaluma River to the east is a vacant remainder parcel and U.S. Highway 101. To the west of the site, beyond the SMART tracks are single-family homes located along the north side of Shasta Avenue. Vacant lands owned by the Petaluma Premium Outlets lie to the northwest of the Project site and beyond are the existing Premium Outlets.

General Plan Land Use Designations

The majority of the Project site has a General Plan land use designation of Medium Density Residential (MDR), which permits a housing density of 8.1 to 18 dwelling units per net acre, and is immediately contiguous to land with the same designation to the east and west (see **Figure 12-2)**. Land southwest of the site, beyond the SMART tracks, along the north side of Shasta Avenue, is designated Mixed Use. Land to the north, beyond the Petaluma River and west of Highway 101 is designated Community Commercial. Lands south of the project site that are part of the Linda del Mar subdivision are designated low density residential (2.6-8.0 housing units per net acre).

At the River, 2.02 acres is designated Floodway; this area does not have development potential. Just inland of the Floodway land use designation are two overlay designations of Floodplain and River Plan Corridor. The River Plan Corridor (also referred to as the Petaluma River Corridor and the PRC within the General Plan) land use designation is defined as those areas determined to be needed for implementation of the 1996 Petaluma River Access and Enhancement Plan (River Plan), and to provide for future floodplain management projects; development is not permitted within the Petaluma River Corridor[2].

In addition, the 0.52-acre Graylawn Avenue landscaped turnaround (APN 019-010-008) which is currently encumbered by an Offer of Dedication to the City as a result of prior TPM #307, consists of two General Plan designations; the circular landscaped area is designated as Open Space and the street itself appears as roadway.

[2] The General Plan generically maps the width of this Petaluma River Corridor (PRC) as 200' from river centerline (gray dashed line at Figure 3-7 labeled as 200' setback). As the purpose of the PRC is to contain the area needed for implementation of the River Plan, its area has been mapped Project specifically to incorporate the Preservation, Restoration and Buffer Zones specified by the River Plan, which are necessary to implement the River Plan. The corridor consisting of these three management zones of the River Plan, referred to as the Petaluma River Plan Corridor in this document, is the same area as the PRC, and is mapped at Figure 6-6.

Figure 12-1
Surrounding Land Uses

Source: Google Maps

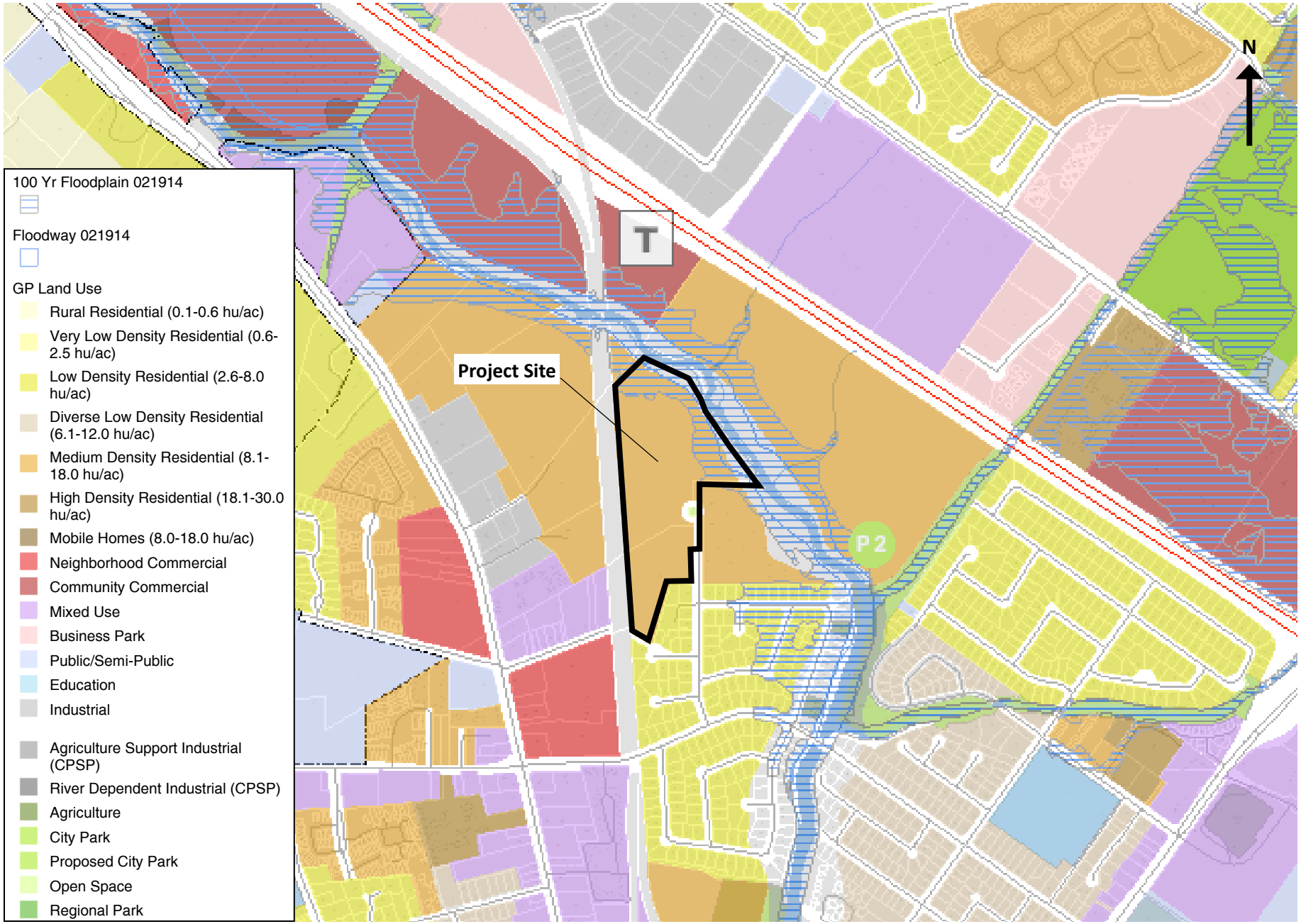


Figure 12-2
General Plan Land Use Map

Source: City of Petaluma, https://xara1-4.cityofpetaluma.net/jsviewers/gplanduse/

The City of Petaluma's 2015-2023 Housing Element identifies the Sid Commons project site as vacant in the Residential Land Inventory Opportunity Site (Site #15). Per the Housing Element, the site exhibits an estimated housing potential of 282 units, with floodplain, wetland and noise environmental constraints. As currently proposed, Sid Commons would introduce 278 market rate multi-family units and would contribute to the City's in lieu housing fund.

Zoning Designations

The existing zoning on the Project site includes R4 (Residential 4), Floodway (FW), Floodplain (FPC) and PUD that was established as part of the Oak Creek Apartments (see **Figure 12-3)**. The R4 zone applies to the southern portion of the site (APN -006), which is currently vacant. The R4 zone is applied to areas intended for a variety of housing types ranging from single dwelling to multi-unit structures. The R4 zone is consistent with and implements the Medium Density Residential land use classification (specifying 8.1 to 18 dwelling units per acre).

The existing PUD zoning was authorized in December of 1982, when the City of Petaluma approved Resolution No. 9628, for the now existing 76-unit Oak Creek Apartments on the 9.44 gross acre (6.33 net acres, after removal of the 3.11 acre Hydraulic Maintenance and Public Access easement) parcel identified as APN -007 (resulting in a density of 12 dwelling units to the net acre). The PUD zone applies to APNs -007, -008 and -009; the Oak Creek Apartments site, the landscaped turnaround, and the northern portion of the Project site respectively. The PUD includes the following conditions:

- "Use of the 11.73-acre vacant portion of the site [i.e., APN -009] shall be limited to uses permitted in the Agricultural District as specified in the Zoning Ordinance."
- "All major accesses to future developments in the remaining vacant property in the vicinity of the project [i.e., APN -009] shall be from the Rainier Avenue extension or other new public street, rather than to streets to the south such as Graylawn Avenue and Burlington Drive."
- "All existing on-site trees shall be permanently preserved".

As part of the proposed Project, an amendment to the PUD is being requested that would revise these conditions (see further discussion, below).

The Floodway (FW) zone defines the channel of the Petaluma River and the adjacent land area that must be reserved in order to adequately discharge the base flood (or 100-year flood) without cumulatively increasing the water surface elevation more than one (1) foot. All areas within the boundaries of the "Areas of Special Flood Hazard" and identified as "Floodway" areas are zoned FW. Since the floodway is an extremely hazardous area due to the velocity of floodwaters that carry debris, potential projectiles and an elevated erosion potential, generally, no encroachments within FW zoned lands are permitted. The FW zone applies to the approximately 2.02 acres of APN -009 at the Petaluma River.

All areas of Special Flood Hazard but outside the Floodway have a Flood Plain Combining (FP-C) designation. Within lands zoned FP-C, the regulations of the underlying zoning district (in this case the PUD zone), shall be combined with and applied in addition to the provisions of the FP-C zone. Within this zone, any permitted principal use, accessory use, or conditional use shall require a development permit, and any new residential construction or substantial improvement of any residential structure shall have the lowest habitable floor elevated at least 2 feet above the level of the base flood elevation or depth specified on the Flood Insurance Rate Map (IZO 6.070.D.2).

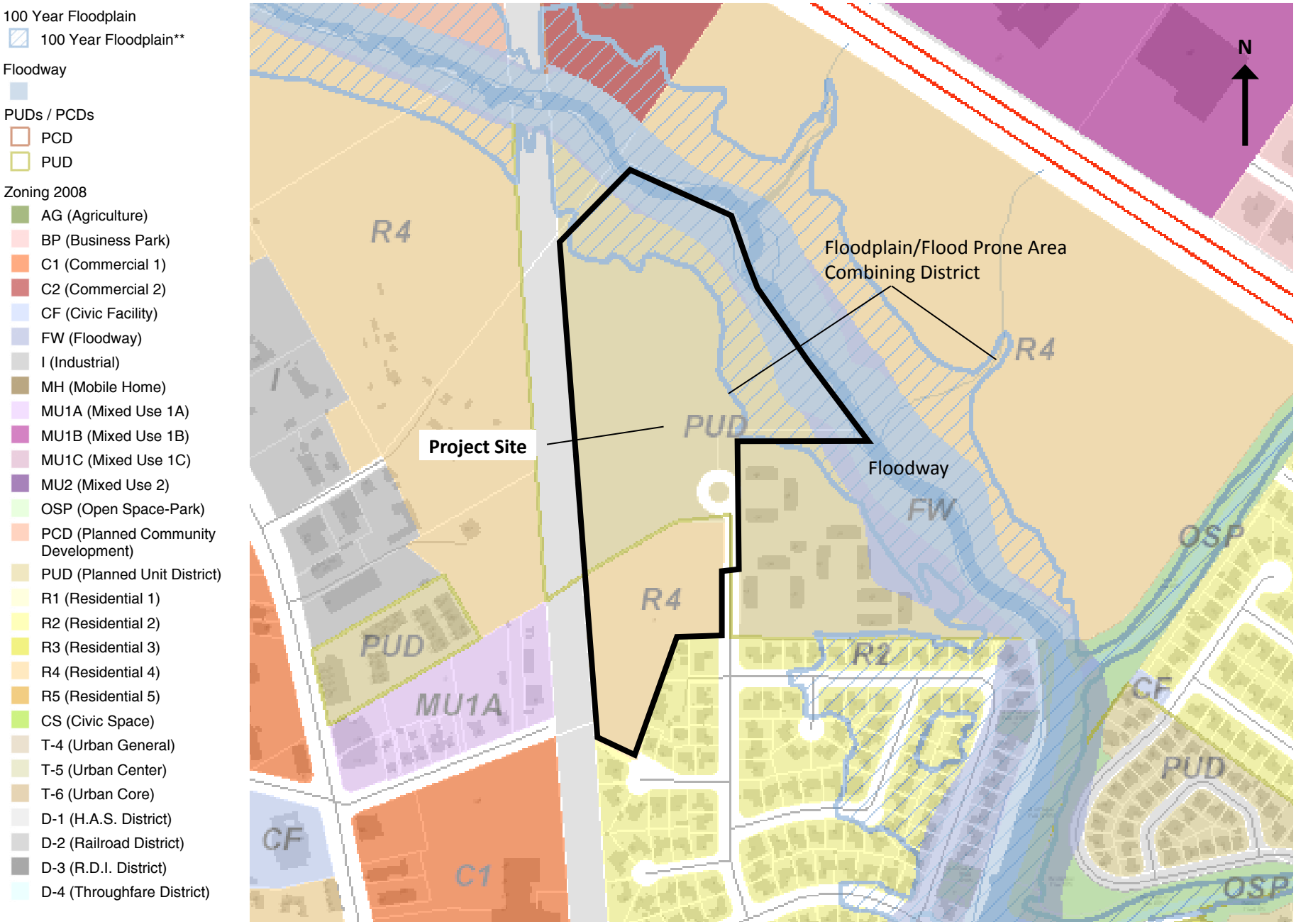


Figure 12-3
Existing Zoning Map

Source: City of Petaluma, https://xara1-4.cityofpetaluma.net/jsviewers/zoning/

The zoning surrounding the project site is consistent with the surrounding General Plan land use designations. Lands on the east side of the river and on the west side of the SMART tracks are zoned R4. The residential neighborhood to the south of the site is zoned R2, the community commercial land use to the north has a corresponding zoning designation of Commercial 2, and the mixed use land along the north side of Shasta Avenue, is zoned Mixed Use 1A.

Assessor's Parcels

The Project site currently consists of three existing County Assessor's Parcel Numbers (APN 019-010-006, 019-010-008, and 019-010-009), totaling approximately 19.24 acres; however as APN -008 is the 0.52 acre landscaped turnaround at the terminus of Graylawn Avenue and proposed by the Project to remain, the Project Site consists of APNs -006 and -009, totaling approximately 18.72 acres.

The project also includes a vesting tentative parcel map relating to approximately 77.71 acres; these are under common ownership and together are referred to as "All Involved Lands". The purpose of the parcel map is to divide the west of the River portion of the Parcel Map #307 remainder parcel (principally being the APN-009) from the east of the River portion of the Parcel Map #307 remainder parcel (APNs 007-390-005 and 136-100-025) and to realign some Project site parcel lines to align with the Project's proposed design. All Involved Lands (77.71 acres) include existing APN -007 (9.45 acres) which contains the existing Oak Creek Apartments. Although no physical development will occur within the Oak Creek Apartments complex itself, the Project does include work near the River within APN -007; that work includes: the southern extent of the proposed river terrace (see Petaluma River Terracing Plan discussion below) and the connection of the existing Oak Creek Apartments river trail to the proposed river trail.

Proposed PUD Amendment, Rezoning and Tentative Parcel Map

The Project application includes a proposed PUD Amendment of the 1982 Oak Creek Apartments PUD, which now governs the northern portion of the Project site (particularly APN -009).

Principally, the PUD Amendment proposes modifying the Oak Creek Apartments PUD by removing the northern portion of the Project site (the vacant APN -009) from the Oak Creek Apartment PUD and by removing or replacing those 1982 Oak Creek Apartments PUD conditions of approval that pertain to and restrict use of the northern portion of the Project site (the vacant portion of the Oak Creek PUD; APN -009), including:

- The stated prohibition of uses other than those permitted in the Agricultural zoning district
- The stated restriction that access to new development not be from Graylawn Avenue, but be from a new Rainier Avenue extension or other new public street (the Project proposes Shasta Avenue and Graylawn Avenue as the two primary access routes to the site)
- The stated restriction that all existing on-site oak trees be permanently preserved

The Oak Creek Apartments PUD will remain and apply to the 76-unit Oak Creek Apartments site (existing APN -007 and any minor modification to the parcel). The Oak Creek PUD and its current land use and access restrictions do not apply or pertain to existing APN -006, therefore no PUD Amendment is necessary for this southern portion of the Project site.

The applicant proposes to Rezone the vacant area of the Oak Creek Apartments PUD (APN -009) to Residential 4 (R4), consistent with the existing Medium Density Residential General Plan designation of the Project site and consistent with the existing R4 Zoning of the southern portion of the Project site (APN -006), as indicated in **Figure 12-4**.

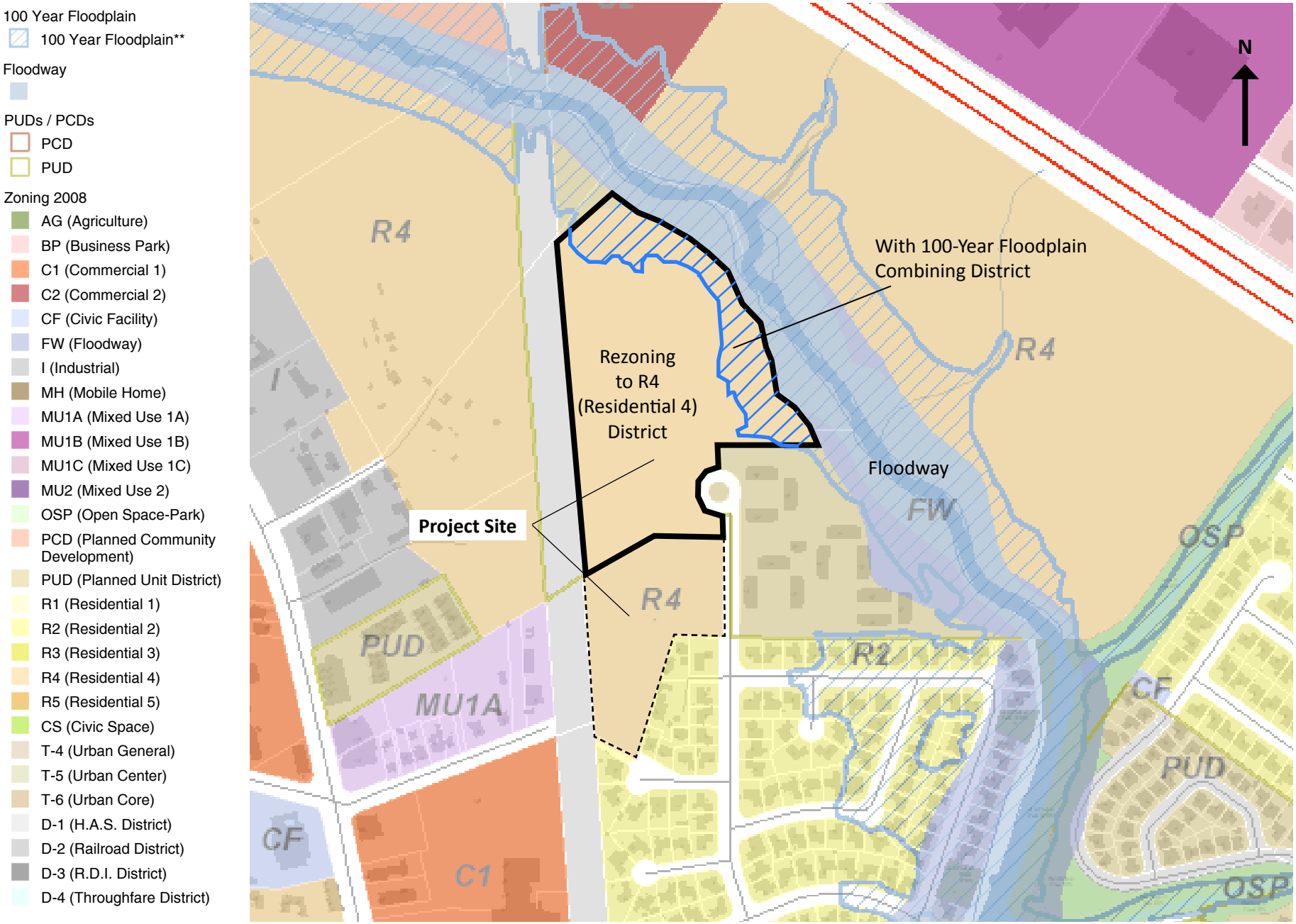


Figure 12-4
Project Proposed Rezoning

Source: City of Petaluma, https://xara1-4.cityofpetaluma.net/jsviewers/zoning/

The proposed PUD Amendment and Rezoning will allow residential development densities consistent with the Medium Density Residential land use designation set forth in the General Plan, at a range from 8.1 to 18 dwelling units per net acre across the full net developable Project acreage (15.45 acres, as shown at Table 3-1). At the maximum density of 18 units per acre, the net developable land could potentially accommodate up to 278 dwelling units.

With the PUD Amendment and Rezoning of APN -009 to R4, the entire Project site would possess the R4 Zoning designation, and development of the Sid Commons Apartment complex would be subject to those standards (in addition to Site Plan and Architectural Review approval) which include a 10 foot front, street side, and rear setback, a 60% maximum lot coverage, a 35 foot height maximum, a 300 square feet of usable open space per unit requirement, and a multi-family parking standard consisting of 1 parking space per bedroom (so long as the resulting number is at least 1.5 parking space per unit). As mentioned above, the R4 zone allows for a variety of housing types ranging from single-family dwellings to multi-unit structures.

Land contiguous to the Petaluma River will continue to be subject to the floodway (FW) designation and the overlay designations of floodplain (FP-C) and Petaluma River Corridor (PRC), as applicable. (Refer to Figure 12-1.)

The Project proposes a vesting Tentative Parcel Map (TPM) for all 77.71 acres of "Involved Lands" (see **Figure 12-5**) to divide the west of the River portion of the Parcel Map #307 remainder parcel (principally being APN -009) from the east of the River portion of the Parcel Map #307 remainder parcel (APNs 007-390-005 and 136-100-025) and to realign some Project site parcel lines to align with the Project's proposed design. Refer to Project Description for further detail, and see summary in Table 12-1 below. The net developable acreage of this Project totals 15.45 acres.

Table 12-1: Proposed TPM Acreage

Proposed	Total Area	Access/Util. Easements	Floodway	Net Developable Area
Parcel 1	9.45	N/A	N/A	N/A
Parcel 2	13.30	0.69	2.02	10.59
Parcel 3	5.93	1.07	0.00	4.86
Remainder	49.03	N/A	N/A	N/A
Total	77.71	1.76	2.02	15.45

Source: Figure 3-3

Parcel 1 contains the existing Oak Creek Apartments.

The Remainder Parcel is lands on the east side of the Petaluma River; no development is proposed.

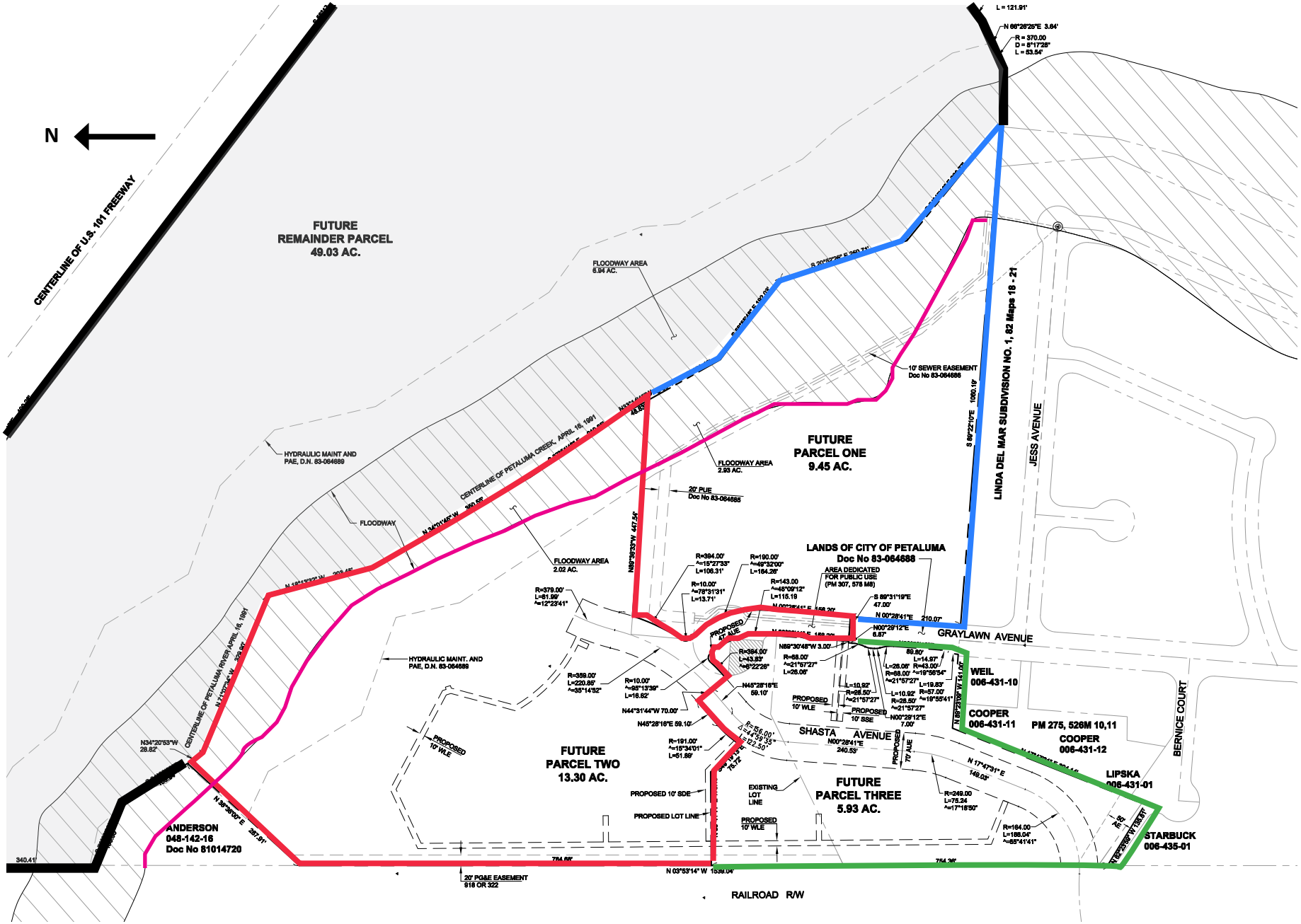


Figure 12-5
Proposed Parcel Map

Source: CSW/Stuber-Stroeh Engineering Group, 8/6/15

Proposed Project

The Project includes a conceptual site plan for the Project site that includes a 278-unit apartment complex within three-story structures, along with a community clubhouse, a swimming pool, and parking sufficient to satisfy the Zoning Ordinance requirement, located on the approximately 15.45-acre net developable portion of the Project site (see Chapter 3: Project Description, Figure 3-7). Four types of residential apartment buildings (A – D) and a clubhouse are included as part of the conceptual design, (see example elevations in Chapter 3: Project Description at Figure 3-8). These conceptual elevation designs are intended to be further refined at the time of the City's Site Plan and Architectural Review (SPAR). While the arrangement of the site plan is expected to be refined during the subsequent Site Plan and Architectural Review process, this EIR analyzes the conceptual site plan consisting of 278 residential units within multiple 3-story structures that comply with R4 zoning standards.

A portion of the Project site along the Petaluma River (4.95 acres) would be improved through implementation of the proposed terracing plan. As described in the project description the terracing component of the project consists of regrading and re-contouring the west bank of the river to provide increased flood capacity and restoration of the riparian corridor.

As noted in the Project Description, the Project is inclusive of the following project components that are not shown on the conceptual site plan:

- The riverside trail shall extend the full width of the project site, connecting the existing Oak Creek Apartment's riverside trail to the northwest property line.
- A public sidewalk/trail shall extend from Graylawn Avenue to the riverside trail and provide connectivity to internal pedestrian walkways at the existing Oak Creek Apartments and new internal pedestrian walkways at the Sid Commons Apartments.
- The land within APN -008, the landscaped turnaround and the roadway around it, shall remain in place (all apartment structures and infrastructure improvements shall be outside of APN -008). Therefore, no General Plan Amendment is necessary to amend the Open Space and roadway designation, and no vacation of the irrevocable offer of dedication is necessary.

Regulatory Setting

Development within the City of Petaluma is reviewed for consistency with applicable plans. The existing planning documents with policies, programs and regulation applicable to the subject Sid Commons Project including the following:

- Petaluma General Plan 2025, adopted in May 2008.
- Petaluma Implementing Zoning Ordinance, adopted in May 2008.
- Petaluma River Access and Enhancement Plan, adopted in May 1996.
- Petaluma Bicycle and Pedestrian Plan, adopted in May 2008.
- Petaluma Floodplain Management Plan, adopted in October 2015.
- Sonoma County Transportation Authority Comprehensive Transportation Plan, 2009.
- Water Quality Control Plan for SF Basin, updated March 2015.

The following discussion provides an overview of each of these planning documents.

Petaluma General Plan 2025

The Petaluma General Plan 2025 was adopted in May 2008 and serves as the guiding planning document for future land uses, development and conservation within City limits. The General Plan provides the legal foundation for all zoning, subdivision, and public facilities ordinances, decisions, and projects under the City's jurisdiction.

The General Plan is organized into the following chapters: 1) Land Use, Growth Management, and the Built Environment; 2) Community Design, Character, and Green Building; 3) Historic Preservation; 4) The Natural Environment; Community Health and Safety; 5) Mobility; 6) Recreation, Music, Parks, and the Arts; 7) community Facilities, Services, and Education; 8) Water Resources; 9) Economic Health and Sustainability; 10) Health and Safety; and 11) Housing.

Petaluma Zoning Ordinance

The City of Petaluma adopted the current Implementing Zoning Ordinance (IZO) on May 19, 2008, which replaced the original 1973 Zoning Ordinance. The intent of the IZO is to provide consistency between the General Plan and the City's zoning regulations. The purpose of the IZO is to protect and promote the public health, safety, comfort, convenience, prosperity and general welfare of residents and businesses within the City. The IZO implements the goals and polices of the General Plan by classifying and regulating the uses of land and structures within the City. The IZO includes regulations for permitted, conditional, accessory and prohibited uses of land and structures; building location and height; parking requirements; and signs.

Petaluma River Access and Enhancement Plan

The Project site is located within the Upstream Segment of the Petaluma River Access and Enhancement Plan (adopted May 1996). The River Plan describes the community's vision for the Petaluma River, including its riverfront uses, activities, and developments. The vision for the Petaluma River includes the restoration and preservation of natural resources, while providing for pedestrian and bike facilities and a high-density water-related commercial environment.

The project site is located within the southernmost portion of the Upstream Segment, which is identified as the most environmentally sensitive primarily due to large stands of native riparian trees as identified in the River Plan.

Petaluma Bicycle and Pedestrian Plan

The Bicycle and Pedestrian Plan (Adopted May 18, 2008) was prepared for the purpose of making Petaluma a pedestrian- and bicycle-friendly community by means of 'complete' streets, infrastructure improvements and transportation planning. The Bicycle and Pedestrian Plan includes goals, policies, and programs to facilitate safe and efficient travel for bicycles and pedestrians in the City.

The subject project would create a multi-use trail suitable for use by bicyclists along the west side of the Petaluma River that would connect to the existing bike trail network. The proposed multi-use trail would be constructed in conformance with the guidelines established in the Bicycle Plan and the Petaluma River Access and Enhancement Plan.

Petaluma Floodplain Management Plan

The Floodplain Management Plan (FMP) described the nature and magnitude of flooding that the City has experienced in the past; provides an update as to flood control improvements implemented to date;

suggests alternative remedies to address flooding citywide; and identified plans for future actions to address flooding problem. The most recent update to the FMP was completed in October 2015. The primary objective of the FMP is to quantify floodplain problems in the City and identify solutions that can be undertaken, if and when funds become available.

Sonoma County Transportation Authority Comprehensive Transportation Plan 2009

The 2009 Comprehensive Transportation Plan (CTP) establishes the following goals as part of the vision for the future of transportation within Sonoma County:

- Maintain the system; relieve congestion; reduce emissions; and plan for safety and health.

The SCTA Vision recognizes that land use policies can influence transportation patterns, and SCTA is committed to improving transit accessibility and non-motorized mobility in an effort to enhance people's travel options, reduce congestion, improve air quality, and encourage high density – mixed use reconfiguration of current land use patterns where feasible.

Development of the Project site as proposed would provide medium-density housing in a portion of Petaluma that would be considered walkable and pedestrian friendly. However, given the location of the Project site relative to existing transit routes, the proposed development would not be considered "transit-oriented development," and a large portion of the population that would be residing at the project site would be expected to rely on motor vehicles for most of their daily transportation needs.

In terms of possible future transit options, the Project site is located adjacent to the right-of-way which is expected to be used for a SMART commuter rail system, yet there is no indication that the site's proximity to the SMART rail system has been considered in the development of the Project site plan to enable future residents to take advantage of such a transit option.

The two proposed transit stations within the City of Petaluma are identified as the Downtown Station to be located at Lakeville and East Washington and the Corona Road Station, to be located at the N. McDowell, Corona Road intersection. The project site is located nearly 1.5 miles southeast of the future Corona Transit Station and approximately 1 mile from the future Downtown Station.

The Draft 2040 Sonoma County Transportation Plan was released in September 2016.

Water Quality Control Plan for the San Francisco Bay Basin

The Basin Plan, developed by the San Francisco Bay Regional Water Quality Control Board, identifies beneficial uses of water within the San Francisco Bay Basin and identifies water quality objectives and the programs to be implemented to meet these objectives and protect water quality within the Basin. The goal of the Water Board's Erosion and Sediment Control Program is to reduce and prevent accelerated (human-caused) erosion to the level necessary to restore and protect beneficial uses of receiving waters now significantly impaired, or threatened with impairment, by sediment. This goal is to be attained through implementation of proper soil management practices. Voluntary implementation is encouraged, but enforcement authority will be exercised where beneficial uses of water are clearly threatened by poor soil management practices. The Water Board has independent authority under the Water Code to regulate discharges of waste to wetlands (waters of the state) that would adversely affect the beneficial uses of those wetlands through waste discharge requirements or other orders. The Water Board may choose to exercise its independent authority under the Water Code in situations where there is a conflict between the state and the U.S. Army Corps of Engineers, such as a jurisdictional determination, or in instances where the Corps may not have jurisdiction. The regulation of "isolated"

waters determined not to be waters of the U.S. is one such instance where the Corps does not have jurisdiction.

The Water Code provides the State and Regional Water Boards clear authority to regulate such isolated, non-navigable waters of the state, including wetlands. It is the intent of the Water Board's General Waste Discharge Requirements (WDRs) to regulate a subset of the discharges that have been determined not to fall within federal jurisdiction. The Water Board has determined that in general, it is preferable to avoid wetland disturbance. When this is not possible, disturbance should be minimized. Mitigation for lost wetland acreage and functions through restoration or creation should only be considered after disturbance has been minimized. For proposed fill activities deemed to require mitigation, the Water Board will require the applicant to locate the mitigation project within the same section of the Region, wherever feasible. The Water Board will evaluate both the project and the proposed mitigation together to ensure that there will be no net loss of wetland acreage and no net loss of wetland functions.

The Project Developer will be required to comply with all current requirements associated with the National Pollution Discharge Elimination System, including the "C.3" requirements, and therefore would be consistent with the Water Board's Erosion and Sediment Control Program. A portion (0.33-acres) of the wetlands identified at the Project site were found to be "waters of the U.S." by the U.S. Army Corps of Engineers and therefore under Clean Water Act jurisdiction for which mitigation is required. These wetlands are also considered waters of the state, and under the regulatory jurisdiction of the Regional Water Quality Control Board. Filling of these wetlands as proposed, in the absence of mitigation approved by the Army Corps and the Regional Water Quality Control Board, would be **inconsistent** with the Basin Plan.

General Plan, River Plan & Bike Plan Consistency Evaluation

The following **Table 12-2** provides a summary of the Project's consistency with the City's 2025 General Plan, the River Access and Enhancement Plan and the Bicycle and Pedestrian Plan. The relevant goals, policies and programs identified are those are particularly applicable to the subject Sid Commons Project. It should be noted that the following table is not exhaustive of all possible consistency determinations; rather it is intended to capture the most relevant policies and focus on those areas where a conflict may be identified.

In addressing Project consistency with the City's existing plans, policies and land use regulations, if the proposed Project were to require a General Plan Amendment, or be inconsistent with particular policies in the General Plan, these factors would not per se amount to a significant environmental effect. Rather, inconsistency with current City policies embodying environmental protection commitments is simply an indication that approval of the Project might lead to adverse effects on physical environment. Thus, in the pages that follow, identified "inconsistencies" does not suggest that any changes to the Project as proposed, if feasible, would be mandated under CEQA as mitigation. In fact, any such changes would be mandatory only if the Planning Commission and the City Council determine that the changes are necessary to avoid an inconsistency with the City's General Plan.

Table 12-2: Project Consistency with City of Petaluma Policies

Relevant Goal, Policy or Program	Analysis
CITY OF PETALUMA: GENERAL PLAN 2025	
Land Use, Growth Management, and the Built Environment	
1-P-1: Promote a range of land uses at densities and intensities to serve the community needs within the Urban Growth Boundary (UGB).	**Consistent.** The Project would introduce a medium density residential development within the UGB, at the upper end of the MDR range of 18 units per acre.
Policy 1-P-2: Use land efficiently by promoting infill development, at equal or higher density and intensity than surrounding uses.	**Consistent**. The Project is an efficient use of vacant land that has been identified for residential development in the Petaluma GP 2025 at a density similar to that of the adjoining Oak Creek Apartments.
Policy 1-P-3: Preserve the overall scale and character of established residential neighborhoods.	**Consistent**. The adjacent Oak Creek Apartments provides rental units at a scale and density similar to, though somewhat less than, that proposed for the Project. Pursuant to section 24.010 of the IZO, the subsequent Site Plan & Architectural Review (SPAR) process must consider the Project's compatibility with the neighborhood in terms of both scale and overall character.
Policy 1-P-14: Require provision of street trees, landscaping, parking and access features to help integrate land uses and achieve an effective transition between uses of disparate intensities.	**Consistent.** The site and landscaping plan shall be subject to subsequent SPAR and mechanisms to achieve an effective transition between the proposed apartment complex and the abutting lower density (R2) residential structures will be reviewed; note specifically Mitigation Measure Visual-3A.
Policy 1-P-28: It is the policy of the City to build within the agreed upon Urban Growth Boundary. No urban development shall be permitted beyond the Urban Growth Boundary.	**Consistent**. The Project is located within the UGB and could reduce pressure to expand the UGB to accommodate additional development elsewhere were this site to remain undeveloped.
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.	**Consistent.** The generically mapped width of the PRC is 200' from the centerline of the River and this 200' line is visible at Figure 6-6. However, as the PRC land use is defined as "Areas determined to be needed to implement the River Plan"; at the Project site, the PRC is the area referred to by this document as the Petaluma River Plan Corridor, see PRPC delineation at Figure 6-6. The Project proposes the creation a flood terrace within the area shown as the PRPC and provides a multi-use trail along the river (consistent with this Policy). The Project does propose Residential structures and improvements within the PRPC; however, MM Bio-10A would preclude such residential development within the area.
Policy 1-P-41: The Petaluma River Corridor (PRC) shall be irrevocably offered for dedication to the City, improved and maintained in perpetuity by the development as adjacent development occurs.	**Consistent**. The Project Applicant has stated their willingness to dedicate the PRC to the City (email dated 4/25/2017).

Table 12-2: Project Consistency with City of Petaluma Policies

Relevant Goal, Policy or Program	Analysis
Policy 1-P-42: Development on lands affected by the PRC designation shall be subject to a discretionary review process beyond that required by CEQA.	**Consistent**. The proposed Project has been subject to discretionary review under CEQA (including this DRAFT EIR and responses to comments) and will be subject to subsequent discretionary review including SPAR. See MM Bio-10B specifying RODZ review at APN-009.
Policy 1-P-43: Development shall incorporate the River as a major design focal point, orienting buildings and activities toward the River and providing water access, to the extent deemed feasible.	**Consistent**. Although the Project would provide public access to the Petaluma River via the proposed multi-use trail, the River does not appear to be the major design focal point. None of the requested entitlements would preclude achieving consistency during SPAR. See MM Bio-10B specifying RODZ review at APN-009, as, consistent with this policy, the RODZ policies and design guidelines direct a river-oriented design focus.
Policy 1-P-44: Develop the Petaluma River as a publicly accessible green ribbon, fronted by streets, paths, and open spaces, by implementing the Petaluma River Access and Enhancement Plan within the context of the PRC Design Standards.	**Consistent**. The proposed multi-use trail along the Petaluma River would enable to Project to be generally consistent with this Policy. Further compliance will be considered at subsequent SPAR.
Policy 1-P-45: Development along the River shall include the creation and maintenance, in perpetuity, of public access sites. Amenities provided may include ramps, steps, docks or other means of access to the water.	**Consistent**. The proposed multi-use trail and overlook would provide public access to the River Corridor near the edge of the Petaluma River. A condition of approval is anticipated to ensure appropriate maintenance mechanisms is created by the applicant. The SPAR process may consider whether any direct public access to the water is appropriate.
Policy 1-P-46: New development shall acknowledge, preserve, protect, and enhance the ecological and biological health and diversity of the Petaluma River.	**Consistent**. Proposed residential development at the Project site would be set back from the existing bank of the Petaluma River. MM Bio-10A would preclude residential development within the Petaluma River Plan Corridor (the 3 management zones of the River Plan). Trees 69, 75, 77, & 79 are proposed for removal within the River area, however MM Bio-10A.b will preserve these trees. Although isolated season wetlands will be filled and temporary disturbance will occur within the riparian corridor, the ultimate improvements provided via the terracing and restoration plan will result in a benefit to the ecological system through the removal of invasive species and the replanting of native species.
Policy 1-P-47: Ensure that the pace of growth does not create spikes that unduly strain City services.	**Consistent**. Although development of the Project would increase the demand for City services, in itself it would not represent a development “spike” that could not be accommodated by City service providers.
Policy 1-P-48: Ensure all new development provides necessary public facilities to support the development.	**Consistent**. The Project incorporates all necessary infrastructure linkages to tie structures at the Project site into all necessary public facilities (e.g., water mains, sewer mains, etc.).

Table 12-2: Project Consistency with City of Petaluma Policies

Relevant Goal, Policy or Program	Analysis
1-P-49 Preserve existing tree resources and add to the inventory and diversity of native/indigenous species.	**Consistent.** The project proposes the removal of approximately 38 of the 68 protected trees, including 6 protected oak trees located within the Petaluma River Plan Corridor. Two of these 6 are necessary to accommodate the river terrace, and the terrace HMMP replants them. Four of the 6 proposed for removal within the PRPC are to accommodate residential development, and shall be preserved by MM Bio-11A.b. Preservation of additional protected trees shall be further considered as directed by MM Bio-11A.c, d, & e. Tree replacement would be determined by and in conformance with the requirements of Chapter 17, Tree Preservation, of the IZO. With mitigation the project would be consistent.
Community Design, Character, and Green Building	
2-P-8 Require single-loaded streets along … riparian corridors to ensure the creation of linear open space corridors with maximum public accessibility, visibility, and opportunities for stewardship.	**Consistent.** The proposed site plan does not include single-loaded streets along the riparian corridor, but does provide visibility to the riparian corridor and the River from the to-be-maintained landscaped terminus of Graylawn Avenue and from the proposed a pedestrian connection from the Graylawn sidewalk to the river trail. MM Visual-3A directs that the SPAR process consider the desirability of a single-loaded street at the River corridor.
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.	**Consistent**. The greenway setback (referred to as the River Plan Corridor by this document) will be implemented with the implementation of MM-Bio 10A. Overall, the Project would create flood terraces, and expand flood storage in the floodplain. The terrace is designed to retain pockets of high priority riparian vegetation along the edge of the river. Although portions of the riparian habitat would be temporarily disturbed, the terracing replanting and restoration plan would remove invasive, reestablish natives, and ultimately enhance oak and riparian habitat. Some onsite low quality wetlands would be permanently filled, but would be replaced within the river terrace. With MM Bio-10A and 11A, 11B, and 11C oak and riparian habit and a buffer of open field to make the oak and riparian habitat visible in contrast will be protected. This EIR includes mitigation measures to protect and enhance biological, natural, and water resources.
2-P-39: Explore the feasibility of using floodplain areas for public spaces and recreational uses, such as on the Johnson Property (see Recreation, Music, Parks, and the Arts Element).	**Consistent**. The proposed multi-use trail represents an element of the Project that would provide enhanced public access to the Petaluma River, consistent with the central aim of this Policy. A majority of the public trail would be located within the 100-year floodplain area and all of it is within the PRPC.

Table 12-2: Project Consistency with City of Petaluma Policies

Relevant Goal, Policy or Program	Analysis
2-P-57: Foster connections to the river from surrounding areas and ensure that new development adjacent to the river is oriented to it.	**Consistent**. While the plan set does not show this detail, the applicant has modified the project description to include extending the river trail from the northern property line to the existing river trail along Oak Creek Apartments and to include a sidewalk connection from Graylawn Avenue to the river trail. While the preliminary project design is oriented toward the center of the site and not toward the river, the applicant has noted a willingness to improve this orientation, and SPAR review shall further consider project orientation to the river; see MM Bio-10B specifying RODZ review at APN-009, as, consistent with this policy, the RODZ policies and design guidelines direct a river-oriented design focus.
2-P-59 Promote greater accessibility and views to Petaluma River through road extensions, bikeways, and trails, including:	
Requiring new development to be oriented to the river, and provide continuous public access parallel to the riverfront.	**Consistent.** The project would provide a new public multi-use trail along the site's frontage to the Petaluma River.
Requiring a new pedestrian/bicycle connection to the river east of Jessie Lane and intersecting with Petaluma Boulevard North.	**Consistent.** Based on preliminary review of project design and building siting, new development is not particularly oriented towards the river, however the applicant has noted a willingness to improve this orientation. See discussion at 2-P-57 and MM Bio-10B. Public access via the trail is provided along the riverfront; the project description clarifies that the project includes a continuous river trail.
Enhancing the ecological diversity of the riparian corridor.	**Consistent**. The described link is north of the project site. However, project's proposal to include an at-grade crossing of the SMART corridor via extension of Shasta Ave to the project site would provide a new pedestrian and bicycle connection between the River and PBN.
Requiring development to enhance the natural ecology along the river.	**Consistent.** The terracing and restoration component of the project would remove invasive species, introduce new native plants and trees, and would be maintained. Thus, ecological diversity in this reach of the river corridor could be enhanced with implementation of a Habitat Mitigation and Monitoring Plan.
2-P-122: Require development projects to prepare a Construction Phase Recycling Plan that would address the reuse and recycling of major waste materials (soil, vegetation, concrete, lumber, metal scraps, cardboard packaging, etc.) generated by any demolition activities and construction of the project.	**Consistent.** The Project Applicant/construction contractor would be expected to develop a Construction Phase Recycling Plan and implement it during site preparation and construction activities at the Project site.
The Natural Environment	
Goal 4-G-1 Biology & Natural Resources. Protect and enhance biological and natural resources within the UGB.	**Consistent.** This EIR includes mitigation measures to protect and enhance biological and natural resources.

Table 12-2: Project Consistency with City of Petaluma Policies

Relevant Goal, Policy or Program	Analysis
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.	**Consistent.** Although some wildlife ecosystems and sensitive habitats nearest the Petaluma River would be avoided with development of the Project site as proposed, other wildlife ecosystems and sensitive habitat areas would not be avoided, and would not be protected. However, this EIR includes mitigation measures to protect and enhance biological resources by requiring onsite and offsite mitigation to offset impacts. Also see Chapter 6, Biological Resources.
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.	**Consistent.** The project has been designed to avoid impacts to species and supporting habitats to the extent feasible. This EIR includes mitigation measures to protect and enhance biological resources. As described in **Chapter 6: Biological Resources**, the project would include mitigation measures for impacts on biological resources that would reduce all project impacts to less than significant levels.
4-P-6 Improve air quality through required planting of trees along streets and within park and urban separators, and retaining tree and plant resources along the river and creek corridors.	**Consistent.** The project would involve removal of a large number of significant trees (see **Chapter 6 – Biological Resources)**. Mitigation provided therein requires preservation of some of these trees, directs SPAR review to aim to preserve additional trees, and requires that trees be replaced, either on-site or at an off-site location.
4-P-15: Improve air quality by reducing emissions from stationary point sources of air pollution (e.g. equipment at commercial and industrial facilities) and stationary area sources (e.g. wood-burning fireplaces & gas powered lawn mowers) which cumulatively emit large quantities of emissions.	**Consistent.** Current building code standards ban the installation of open-hearth, wood-burning fireplaces and wood stoves in new construction. It does, however, allow for the use of low-polluting wood stoves and inserts in fireplaces approved by the federal Environmental Protection Agency, as well as fireplaces fueled by natural gas. Development of the Project site as proposed would contribute to air pollution, both locally and within the region (see **Chapter 5: Air Quality and Greenhouse Gas Emissions**, above). All development would be required to comply with Title 24 standards, achieve CalGreen and would be required to employ all dust abatement mitigations as appropriate under the BAAQMD CEQA Guidelines.
4-P-16 To reduce combustion emissions during construction and demolition phases, the contractor of future individual projects shall encourage the inclusion in construction contracts of the following requirements or measures shown to be equally effective (refer to GP 2025 for complete Policy description).	**Consistent.** Implementation of Mitigation Measure Air-2 as set forth in **Chapter 5: Air Quality and Greenhouse Gas Emissions**, above, would result in compliance with the construction period emission reduction measures identified in this Policy and also the requirements of the BAAQMD for construction projects.
4-G-6: Greenhouse Gas Emissions. Reduce the contribution to greenhouse gases from existing sources and minimize the contribution of greenhouse gases from new construction and sources.	**Consistent.** The project would not conflict with the state's AB 32 goal and associated Scoping Plan estimates of reducing GHG emissions to 1990 levels by 2020, the City of Petaluma Greenhouse Gas Emissions Reduction Action Plan to reduce GHG emissions by 20 percent, or the GHG policies in the City of Petaluma General Plan.

Table 12-2: Project Consistency with City of Petaluma Policies

Relevant Goal, Policy or Program	Analysis
4-P-21: Reduce solid waste and increase recycling, in compliance with the Countywide Integrated Waste management Plan (CoIWMP).	**Consistent.** Compliance with the requirement to prepare a construction waste managed plan will insure that all solid waste disposal meets the diversion targets.
Mobility	
5-P-4: New development and/or major expansion, or change of use may require construction of off-site mobility improvements to complete appropriate links in the network necessary for constructing the proposed development with existing neighborhoods and land uses.	**Consistent**. As indicated in Chapter 14: Traffic and Circulation, the Project would contribute to significant cumulative traffic impacts at several intersections off-site. Implementation of the mitigation measures identified in **Chapter 14** would reduce these impacts to a level of less than significant.
5-P-6 Ensure new streets are connected into the existing street system and encourage a grid based network of streets.	**Consistent.** Although the proposed streets serving the Project site are not laid out in a grid pattern, the proposed extension of Shasta Avenue on to the site and to Graylawn Avenue, would provide an additional connection within the existing street system.
5-P-7: Where aesthetic, safety, and emergency access can be addressed, allow narrower streets in residential development to create a pedestrian scaled street environment.	**Consistent.** Streets shown on the Project site plan would meet City standards, and would not be narrower than normally required in a development of this type.
5-P-11: Require proposed development to assist, in addition to seeking other funding sources, in the funding and construction of the following improvements (refer to GP 2025 for complete Policy description).	**Consistent.** As indicated in **Chapter 14: Traffic and Circulation**, where Project-related traffic would contribute to significant adverse cumulative effects on traffic congestion at intersections in the vicinity, the Project Applicant would contribute toward implementation of appropriate mitigation measures to reduce these impacts to a level of less than significant. This would include contributing toward the cost of roadway intersection improvements.
5-G-5: Bicycle and Pedestrian Improvements. Create and maintain a safe, comprehensive, and integrated bicycle and pedestrian system throughout Petaluma that encourages bicycling and walking and is accessible to all.	**Consistent.** The project would extend the existing Class I bike trail along the river to the project limit, as identified in the Bicycle Facilities Figure (5-2 of the General Plan).
5-P-18 The City shall require Class II bike lanes on all new arterial and collector streets.	**Consistent.** The project would include 6-foot wide Class II bike lanes on both sides of Shasta Avenue between Petaluma Blvd and the Railroad as well as onsite.
5-P-19 All new and redesigned streets shall be bicycle and pedestrian friendly in design.	**Consistent.** The project would include bike and pedestrian facilities.

Table 12-2: Project Consistency with City of Petaluma Policies

Relevant Goal, Policy or Program	Analysis
5-P-20 Ensure that new development provides connections to and does not interfere with existing and proposed bicycle facilities.	**Consistent.** The proposed development would provide a multi-use trail along the Petaluma River, which would enhance access for bicyclists, and would not interfere with any existing or proposed bicycle facilities. If the Project's proposed at-grade rail crossing at Shasta Avenue is approved by the CPUC, then Mitigation Measure Transp-8A would require the Shasta Extension to Graylawn to include a continuation of street improvements to the existing off-site road section of Shasta Avenue, from west of the rail tracks to the intersection at Petaluma Boulevard. The re-design shall be subject to review and approval at time of Improvement Plan review. Petaluma City Staff will coordinate review of all aspects of the improvements with the appropriate review committees. The Project's off-site improvements shall re-design Shasta Avenue to include a roadway street design and construction standard that meets the City of Petaluma's standards as a collector road including improvements to the multi-modal function of Petaluma Boulevard and potentially Shasta Avenue, specifically at the intersection at Shasta/Petaluma Boulevard, as well as the introduction of pedestrian and transit amenities such as wider sidewalks, special paving treatments, landscaped medians, and street trees.
5-P-22 Preserve and enhance pedestrian connectivity in existing neighborhoods and require a well-connected pedestrian network linking new and existing developments to adjacent land uses.	**Consistent.** The Project would enhance pedestrian connectivity with the surrounding neighborhood (via the proposed extensions of Shasta over the railroad tracks to Graylawn Avenue and of the Graylawn Avenue sidewalk to the river trail) and along the Petaluma River (via the proposed multi-use trail).
5-P-23 Require the provision of pedestrian site access for all new development.	**Consistent.** The project would include pedestrian facilities that connect to existing facilities.
5-P-26: Require all new development and those requiring new city entitlements with "frontage" along creeks and the river to permit through travel adjacent to creeks and the river with access points from parallel corridors spaced at minimum intervals of 500-1,000 feet	**Consistent.** The proposed multi-use trail would provide public access "frontage" along the Petaluma River, extending the existing Oak Creek Apartments river trail northwest across the Project site to the far property line.
5-P-28: Allow bicyclists and pedestrians use of all emergency access routes required of existing and new developments.	**Consistent.** All emergency access routes proposed at the Project site (Bernice Court) would be accessible to pedestrians and bicyclists.

Table 12-2: Project Consistency with City of Petaluma Policies

Relevant Goal, Policy or Program	Analysis
5-P-50 Maintain the NWP/SMART corridor for mobility purposes and ensure that any future projects adjacent to or near the rail corridor be planned with safety of the rail corridor in mind, especially with regard to pedestrian and vehicle circulation. Design treatments should include appropriate fencing, improvements to existing at-grade crossings, and coordination with the California Public Utilities Commission (PUC).	**Inconsistent.** The placement of a new at-grade rail crossing via the extension of Shasta Ave, as proposed would result in an increased risk of collisions involving trains and motor vehicles, bicyclists and pedestrians, and could be expected to result in some slowing of train speeds in this corridor relative to what would be anticipated in the absence of such a crossing. CPUC has indicated they are not supportive of new at-grade crossings including at this specific location. Mitigation Measures Transp-7A and Transp-9A recommend providing a grade-separated bridge crossing over the rail tracks at the Shasta Extension to Graylawn. If a grade-separated crossing is found infeasible, Mitigation Measures Transp-7B and Transp-9B provide for at-grade rail crossing safety measures that include a summary of safety measures presented in the Federal Highway Administration's Railroad-Highway Grade Crossing Handbook. The safety measures presented in the Grade Crossing Handbook are primarily intended to increase safety at existing highway/rail crossings, and the Handbook specifically indicates that "generally, new grade crossings, particularly on mainline tracks, should not be permitted unless no other viable alternatives exist." Additionally, Mitigation Measure Transp-9C requires fair-share contributions towards at-grade rail crossing safety measures at Payran Avenue to improve pedestrian and bicycle safety for Project residents and others at the existing Payran Street at-grade rail crossing.
Recreation, Music, Parks, and the Arts	
6-P-20 Where trees, larger than 8" in diameter, must be removed to accommodate development, they shall be replaced at a ratio established in the Development Code. Replacement trees may be planted on, or in the vicinity of, the development site, subject to approval by the Community Development Department or through the discretionary approval process.	**Consistent.** The project would result in the removal of approximately 38 of the 68 protected trees. Four trees within the River Plan Corridor shall be preserved by MM Bio-10A and 11A.b. Preservation of additional protected trees shall be further considered as directed by MM Bio-11A.c, d, & e. Tree replacement would be determined by and in conformance with the requirements of Chapter 17, Tree Preservation, of the IZO. With mitigation the project would be consistent.
Community Facilities, Services, and Education	
7-P-19 Maintain a four-minute travel time for a total of 6-minute response time for emergencies within the City.	**Consistent.** The project would provide a new access route via the proposed at-grade crossing and extension of Shasta Avenue to Sid Commons, which would help maintain a 4-minute travel time for a total of 6-minute response time for emergencies within the City. In the event that the CPUC crossing is not approved the access via Graylawn and the proposed Bernice EVA would be sufficient to maintain travel response time.
7-P-28 Expand the capability of the Fire Department to respond to River related emergencies.	**Consistent.** The project would provide enhanced access to the Petaluma River for use by the Fire Department to respond to River related emergencies via the new trail.

Table 12-2: Project Consistency with City of Petaluma Policies

Relevant Goal, Policy or Program	Analysis
7-P-35: Incorporate, into new development to the extent deemed appropriate and feasible, the Development Code Urban Design Standards for crime prevention.	**Consistent.** As a condition of Project approval, the City will require incorporation within the site design of the Project those elements of the Development Code Urban Design Standards deemed appropriate for adequate crime prevention.
7-P-42: Recognize the health benefit of a "walkable" community with neighborhood access to parks and trails.	**Consistent.** The Project would provide a multi-use trail along the property frontage with the Petaluma River, and would provide pedestrian connection throughout the proposed development. The Project would be conditioned to ensure connectivity of sidewalks to the multi-use trail.
Water Resources	
8-P-20 Manage groundwater as a valuable and limited shared resource by protecting potential groundwater recharge areas and streamsides from urban encroachment within the Petaluma watershed.	**Consistent.** The project would include drainage and recharge features to protect potential groundwater recharge areas and streamsides from urban encroachment within the Petaluma watershed.
8-P-28: The area upstream of the Corps weir, and below the confluence of Willowbrook Creek with the Petaluma River, located within the 1989 FEMA floodplain (and any amendments thereto) shall include a Petaluma River Corridor (PRC) set aside for the design and construction of a flood terrace system to allow the River to accommodate a 100-year storm event within a modified River channel, to the extent feasible given existing physical and natural constraints.	**Consistent**. Development of the Project site as proposed includes provisions for the design and construction of a flood terrace system in accordance with this policy.
8-P-30 Within a 200' setback from centerline of the Petaluma River, within the UGB, no additional development shall be permitted on lands within that 400' wide corridor, given natural and physical constraints, unless the proposed development fully complies with the interim development standards as defined in 8-P-29 B, until such time as the study referred to in Policy 8-P-29-B is concluded and approved by the SCWA and City of Petaluma. Thereafter all lands affected shall set aside the necessary river and/ or creek corridor areas and, as development occurs, shall undertake the identified surface water containment enhancement improvements.	**Consistent.** As proposed no structures within the Project site will be located within the 200' setback from the centerline of the Petaluma River.
8-P-31: In accordance with the studies undertaken for the Corps Flood Protection project, existing areas subject to periodic surface water inundation and containment, within the Corona and Denman Reaches (Lynch Creek confluence with the Petaluma River upstream to the Old Redwood Highway over-crossing of Willowbrook Creek), shall be preserved and enhanced where feasible to reduce localized flooding.	**Consistent.** Portions of the Project site have been subject to inundation in the past, and the XP-SWMM modeling for the Project indicates that similar flooding may be anticipated in a 100-year flooding event (see **Chapter 10: Hydrology**). However, the proposed Project includes terracing to increase the capacity of the river and precludes development of habitable structures within the 100-year floodplain.

Table 12-2: Project Consistency with City of Petaluma Policies

Relevant Goal, Policy or Program	Analysis
8-P-33 The City shall continue to implement mandatory zero-net fill upstream of the Payran transition weir, and when appropriate utilize zero-net runoff, to assess site-specific impacts and identification of mitigations.	**Consistent.** As currently structured, the City's zero-net fill and zero-net runoff requirements apply to areas within the 100-year floodplain. As indicated in **Chapter 10: Hydrology**, above, XP-SWMM modeling for the proposed Project indicates that portions of the Project site that are proposed for development with structures would be above and outside the area that would be subject to flooding in a 100-year flooding event.
8-P-36 Require development on sites greater than 1/4 acre in size to demonstrate no net increase in peak day stormwater runoff, to the extent deemed practical and feasible.	**Consistent.** The project would install its own storm water drainage system, including vegetated swales, bioretention areas, and outfalls to the Petaluma River, which would ensure runoff from new impervious surfaces would not affect the capacity of the existing storm water drainage system.
8-P-37 No new inhabited structure or development shall be permitted within that portion of properties containing areas of water depths exceeding one foot as illustrated in Figure 8-2, unless mitigation and/or on-site or off-site improvements are constructed to reduce the 100-year flood depth to less than one foot.	**Consistent.** No development is proposed within the portion of the Project site subject to flood flow depths exceeding one foot. This is demonstrated in Figure 11-3.
8-P-38 All development activities shall be constructed and maintained in accordance with Phase 2 National Pollutant Discharge Elimination System (NPDES) permit requirements.	**Consistent.** All development at the Project site will be required to comply with the construction and maintenance provisions of the Phase II NPDES permit requirements, including the implementation of a Storm Water Pollution Prevention Program (SWPPP).
Health and Safety	
10-P-1 Minimize risks of property damage and personal injury posed by natural hazards.	**Consistent.** The project site is not located within an Alquist-Priolo zone, and therefore, no earthquake faults underlie the project site and ground ruptures of an earthquake fault would be unlikely to occur within the project site. The project would be designed and constructed in accordance with all measures as recommended in the geotechnical report for the project to reduce the risk of seismic hazards.
Noise	
10-P-3 Protect public health and welfare by eliminating or minimizing the effects of existing noise problems, and by minimizing the increase of noise levels in the future.	**Inconsistent**. The project could result in a significant increase in noise due to the introduction of an at-grade crossing and the requirement for warning noise sounding. The proposed residential use at the Project site and in the vicinity are noise-sensitive. New apartment buildings would be only a short distance from the existing rail corridor which is expected to generate noise levels greater than 65 dBA as trains pass the site. Additionally, project-related traffic would contribute to a cumulative noise increase to levels above 65 dBA along Shasta Avenue once it has been extended as proposed to provide access to the Project site. Such an increase in noise levels would be considered a significant increase under this Policy. Mitigation set forth in the Noise Chapter are not sufficient to achieve less than significant impacts to noise.

Table 12-2: Project Consistency with City of Petaluma Policies

Relevant Goal, Policy or Program	Analysis
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.	**Consistent**. Pursuant to Mitigation Measure Hydro-1: SWPPP Requirements, the emergency procedures for hazardous materials releases shall be set forth in the SWPPP and include specifics for personal protective equipment, spill containment procedures, and training of workers to respond to accidental spills/releases. Contractor(s) shall be required to have on hand at all times adequate absorbent materials and containment booms to handle a spill equivalent to the largest container of fuels or oil in their possession.
Housing	
11-P-2: Encourage the development of housing on underutilized land.	**Consistent**. The Project site is currently vacant, although it has been designated for medium density residential development in the City's General Plan.
11-P-3: Encourage a mix of housing design types.	**Consistent**. The housing design type proposed at the Project site is apartment buildings. There is a mix of unit types within the apartment buildings. The provision of rental apartments, in general, would expand the mix of housing types within the City overall.
11-P-7: Assign a share of the responsibility for providing affordable housing to the developers of market-rate housing and non-residential projects.	**Consistent**. The Project as currently proposed does not include any below-market rate housing units but the Project Applicant has indicated the intention to make an *in-lieu* fee payment to the City's Housing Fund.
11-P-20: Promote the use of energy conservation features in the design of residential development.	**Consistent**. The Project would incorporate energy conservation features required to meet current Title 24 requirements as well as Section 66473.1 of the Subdivision Map Act. As proposed the project incorporates trees along streets and in parking areas.
CITY OF PETALUMA RIVER ACCESS & ENHANCEMENT PLAN	
Goal 1: Maintain the navigability of the Petaluma River.	**Consistent.** The project proposes a river terrace along the project site frontage to the Petaluma River. This will result in limited modifications to the river channel and will not reduce the navigability of the Petaluma River compared to the existing conditions.
Goal 2: Improve flood control.	**Consistent.** The project provides for terracing which will improve the surface flood elevations and provide for increased capacity of the river consistent with the River Access Plan and the General Plan.
Goal 3: Promote balanced use of the River Corridor.	**Consistent.** The project balances the need for flood control and habitat preservation by incorporating a terracing component and implementing a replanting and restoration plan to the area along the River frontage.

Table 12-2: Project Consistency with City of Petaluma Policies

Relevant Goal, Policy or Program	Analysis
Goal 4: Restore, create and protect natural habitats and enhance native vegetation along the river corridor.	**Consistent.** The project identifies areas of important native vegetation to be preserved, areas where invasive species are present and should be removed and restored, and provides for increased native vegetation through the re-planting and restoration plan (Habitat Mitigation Monitoring Plan).
Goal 5: Expand public access to and awareness of the river.	**Consistent.** The project provides an 8-foot wide public multi-use trail along the site frontage to the river and includes internal paths for new residents to access onsite. Portions of the trail will include interpretive signs and information that identify important features and improvements as part of the terracing effort.
Goal 6: Assure permanent maintenance and promote public safety along the river.	**Consistent.** The project will be conditioned to provide for a long-term maintenance agreement. No direct access into the river will be provided along this segment of the river in accordance with policies and programs established for the Corona Reach-Oak Woodland/Riparian Vegetation Area, which restrict access within the preservation and restoration zone. Overlooks may occur within the buffer and restoration zone, but will be limited to areas that are not sensitive.
Flood Management Objectives	
Objective 2.1: Encourage the design of flood protection alterations in as environmentally sensitive and aesthetically pleasing a manner as possible.	**Consistent.** The Project proposes terracing within the floodway and floodplain to assist with flood control objectives and restricts development from areas that are within the 100-year floodplain. The terrace design aims to enhance the river capacity while preserving high quality vegetation as feasible. The Habitat Mitigation Monitoring Plan sets forth the re-planting and restoration plan including development of onsite wetlands.
Objective 2.2: Flood protection measures should accommodate the enhancement and/or restoration of a continuous riparian habitat, repair and prevent bank erosion, and provide segments of the trail system with maintenance roads, maximum repair and utility of the channel should be incorporated into project designs wherever feasible.	**Consistent.** Although a portion of the riparian habitat areas adjacent to the Petaluma River will be temporarily disturbed during the terracing development, at completion of the terracing and with implementation of the HMMP, flood protection and habitat restoration and enhancement, as well as bank stability will be provided.
Objective 2.3: Encourage the use of flood channel maintenance rights-of-way as public access trails, designed to the standards and locations designated in the River Plan.	**Consistent.** The Project includes a multi-use trail along the Petaluma River frontage of the property. Designs incorporate view spots and a meandering path and will retain public access.
Policy 1: In-channel and channel bank public access structures should not increase flood elevations.	**Consistent.** The proposed development of a multi-use trail and overlooks along the Petaluma River frontage of the property as part of the Project would not change flood elevations. Grading proposed within the banks of the river for terracing generally includes a gradual (5%) slope beginning at the low-flow channel of the River and rising between 5 to 10 feet in elevation, with a steeper banked (2:1) slope meeting existing grade at the upland portion of the site. In the lower reach, this steeper bank rises in elevation by as much as 10 feet, and in the upper reach, the steeper bank has only about a 4 to 5 foot rise.

Table 12-2: Project Consistency with City of Petaluma Policies

Relevant Goal, Policy or Program	Analysis
Policy 4: Inter-plant riprap or replace riprap with planted erosion control blocks or other vegetative/structural means of bank stabilization. Use of new riprap for bank slope protection is discouraged in favor of biotechnical approaches outlined in Chapter 5.	**Consistent.** The proposed terracing plan has been developed in close collaboration with WRA biologists and is designed to utilize natural features. The HMMP will provide stabilization through establishment of native and riparian vegetation within the terrace. Vegetation and terracing provides biotechnical means to achieve bank stabilization.
Program 1a: Maintain river channel capacity whenever new structures or fill are added by excavation or removal of other channel constraints.	**Consistent.** As proposed the terracing plan will enhance channel capacity in part through the excavation and removal of approximately 21,140 cubic yards of soil.
Balanced Use Objectives	
Objective 3.1: Encourage the development of properties along the river corridor in a manner that responds to the riverfront location, enhances the riverfront environment, and provides public access, and is consistent with the General Plan, as further defined by this Plan.	**Consistent.** The proposed development orients towards to center of property rather than the river, however the applicant has noted a willingness to improve this orientation, and SPAR review shall further consider project orientation to the river; see also MM Bio-10B specifying RODZ review at APN -009. The project includes the development of a multi-use trail that would provide public access along the river frontage.
Objective 3.6: Encourage preservation, restoration and enhancement of the river's natural habitats, in order to reestablish the riparian landscape as an integral and prominent part of the City.	**Consistent.** Development of the Project, including the terracing and restoration component, would promote the reestablishment of the riparian landscape while providing enhanced flood control protection.
Habitat and Vegetation	
Objective 4.1: Protect and restore habitat areas, including seasonal and perennial tributaries and wetlands, along and adjacent to the river as identified in the individual river segment descriptions.	**Consistent.** Development of the Project site as proposed would result in the loss of 0.34 acres of seasonal wetlands. It would avoid impacts to 0.28 acres of wetland and would create 0.54 acres of new seasonal wetland. MM Bio-4 specifies mitigation to offset losses to season wetlands.
Objective 4.2: Encourage continuous native riparian and aquatic vegetation along the low-flow channel, channel banks and terraces to provide natural habitat for land and water animals.	**Consistent.** The proposed Habitat Mitigation and Monitoring Plan sets forth planting zones using a riparian plant pallet in order to restore natural habitat.
Objective 4.3: Establish and maintain habitat management zones within the river corridor.	**Consistent.** The proposed Habitat Mitigation and Monitoring Plan sets forth planting zones to mimic natural conditions and establish a transition from aquatic to terrestrial zones.
Objective 4.4: Establish locations for habitat mitigation.	**Consistent.** The proposed Habitat Mitigation and Monitoring Plan identifies locations for replanting, creation of wetlands, and restoration in order to provide onsite habitat mitigation.
Policy 1: Encourage habitat continuity linkages to enable "safe passage" for wildlife between the downstream salt marshes and the upstream freshwater riparian areas.	**Consistent.** The area within the Petaluma River Corridor including the terracing and reestablishment of a riparian corridor would provide habitat linkages. During development of the terrace, habitat continuity would be temporarily discontinuous along this segment of the river.

Table 12-2: Project Consistency with City of Petaluma Policies

Relevant Goal, Policy or Program	Analysis
Policy 2: Replace invasive exotic plants of limited habitat value with native or compatible species and plant communities.	**Consistent.** Site preparation and terracing activities, would entail removal of existing vegetation within the portion of the Project site to be developed. Terracing activities include removal of non-native and invasive species. The replanting plan utilizes native species in order to promote the retention and reestablishment of native communities.
Policy 3: Stabilize eroding and erosion-prone banks through the use of bio-geotechnical techniques, whenever possible.	**Consistent.** The terracing plan involves re-contouring the riverbank including areas subject to erosion and reestablishment using bio-geotechnical techniques such as benched elevations, retention of trees and a planting pallet selected based on the terraced zone.
Policy 4: Encourage habitat enhancement with flood management alterations.	**Consistent.** The proposed Habitat Mitigation and Monitoring Plan identifies locations for replanting, creation of wetlands, and restoration in order to encourage habitat enhancement with the proposed terracing.
Policy 5: Follow maintenance and vegetation management practices which nurture native species, plant communities and are consistent with public safety requirements for flood protection and trail use.	**Consistent.** The proposed Habitat Mitigation and Monitoring plan utilizes native species for replanting, accommodates flood protection by increasing the river capacity and introduces a multi-use trail. Ongoing maintenance and monitoring will ensure the continued function of the terrace for flood protection purposes and the successful establishment of a native corridor for habitat enhancement.
Policy 7: Confine public access to the least sensitive habitat zones, such as the buffer areas and flood terraces, with only occasional limited intrusions into habitat restoration zones for overlooks and interpretive uses.	**Consistent.** The proposed multi-use path and the overlook along the Petaluma River frontage are designed to avoid the most sensitive habitat zones. Signage, fences and other features will be considered at SPAR and conditioned accordingly to ensure sensitive areas, such wetlands, are properly marked to discourage access.
Policy 8: Encourage the establishment and implementation of an urban runoff control program consistent with state and federal goals in order to maintain or improve the quality of the water discharged into the river.	**Consistent.** The Project is required to comply with all NPDES and "C.3" requirements related to maintaining and improving water quality. Accordingly, surface runoff will be directed through graded swales to provide passive filtration to the extent possible and through filter inserts installed in the drainage system in areas that require direct discharge into the storm drain.
Program 8a: Stabilize riverbanks to minimize erosion and siltation of the river.	**Consistent.** The proposed terracing precludes steep sloping bank, uses benches to step down in elevation, includes replanting and would assist in stabilizing riverbanks and reducing erosion.
Program 8b: Maintain a regular street-sweeping and culvert inlet maintenance program, particularly in the months prior to the rainy season.	**Consistent. T**he City of Petaluma may impose conditions of approval that require the Project Developer (and, subsequently, the owner of the apartment complex) to periodically sweep adjoining streets and parking areas and clean culvert inlets at the site.

Table 12-2: Project Consistency with City of Petaluma Policies

Relevant Goal, Policy or Program	Analysis
Program 8c: Encourage the use of passive methods of cleaning urban runoff, such as bioremediation in new freshwater wetlands and other forms of natural filtration, where there is sufficient space within the buffers or flood terraces before the runoff reaches the river.	**Consistent.** The Project includes bioretention areas and storm water Best Management Practices (BMPs) which would include on-site bio filtration and vegetation uptake features that assist in protecting water quality. As described in the Hydrology Chapter, runoff will be directed to graded swales in order to provide passive filtration. In areas that do not discharge directly into a passive system, filter inserts will be installed in drainage structures.
Access and Awareness	
Objective 5.1: Establish a continuous pedestrian and bicycle trail system as designated in this Plan.	**Consistent.** While the plan set does not show this detail, the applicant has modified the project description to include a continuous river trail connecting the existing trail along Oak Creek Apartments to the far northern property line.
Objective 5.4: Create trail access points at the ends of public streets that terminate at the river whenever feasible. Seating, pedestrian lighting, bicycle parking signs, planting, water access, and other amenities shall be encouraged.	**Consistent.** While the plan set does not show this detail, the applicant has modified the project description to include a sidewalk connection from Graylawn Avenue to the river trail.
Objective 5.10: Provide informal resting areas with seating and views of the significant features along the river.	**Consistent.** The proposed overlook area along the multi-use trail would be conditioned to provide benches for seating and intermittent view opportunities.
Objective 5.11: Interpret the river corridor's natural and cultural heritage in an integrated, varied and engaging manner.	**Consistent.** The proposed multi-use trail will be conditioned to incorporate interpretive signs along the trail.
Maintenance Objectives	
Objective 6.1: Establish ongoing, cost effective maintenance and vegetation management procedures for the trail and river greenway.	**Consistent.** It will be the responsibility of the Project Developer (and, subsequently, the owner of the apartment complex) to provide long-term, on-going maintenance of the proposed multi-use trail. The Habitat Mitigation Monitoring Plan sets forth planting pallet, maintenance specification and criteria to assess success of establishment within the terrace area.
Objective 6.2: Manage the greenway as a self-sustaining natural resource, not as a manicured landscape.	**Consistent**. The area adjacent to the river at the Project site which will support the proposed multi-use trail will be maintained and planted with riparian species as set forth in the Habitat Mitigation Monitoring Plan.
Objective 6.6 Obtain cooperative agreements between the City and property owners for trail and greenway improvements.	**Consistent**. As the General Plan requires, the developer will construct and maintain the multi-use trail and greenway improvements.

Table 12-2: Project Consistency with City of Petaluma Policies

Relevant Goal, Policy or Program	Analysis
Objective 6.8: Discourage unnecessary and indiscriminate use of herbicides, pesticides, and fertilizers within the river corridor.	**Consistent**. The Project Developer (and subsequently, the apartment complex owner) would be responsible for limiting the use of herbicides, pesticides and fertilizers to the maximum extent feasible. The project will be required to comply with the NPDES General Permit for the Discharge of Storm Water from Small MS4s (SWRCB 2013), which prescribes methods for residential developments to control and treat stormwater runoff. The Small MS4 General Permit also requires implementation of source control measures for specific pollution-generating activities such as accidental spills or leaks, landscape/outdoor pesticide use, and for pools, ponds, or other water features.
Objective 6.10: Manage the river corridor in a manner that respects adjacent uses, activities, and natural features, such as significant trees and wetlands.	**Consistent.** Development would preserve the primary wetlands near the river. While lower value wetlands would be filled, and riparian vegetation lost, these would be replaced on site, see discussion at Biology Chapter. Mitigation Measure Bio-10A and 11A requires the Project to achieve greater consistency with the City's River Plan by preserving protected trees in the Petaluma River Plan Corridor proposed to be lost to accommodate residential development (trees 69, 75, 77, and 79) and requires additional upland protected trees to be preserved to the greatest extent possible. While it is recognized that the preservation of all existing trees on the Project site may conflict with reasonable land development considerations, the design of the Project shall seek to preserve the most desirable and significant healthy trees on site.
Public Safety	
Objective 7.1: Accommodate emergency vehicle access to the trail at appropriate intervals from adjacent property or roadways.	**Consistent.** The proposed site improvements are sufficient to accommodate emergency access to the multi-use trail.
Objective 7.2: Discourage trail use within the channel during periods of hazardous high floodwater.	**Consistent.** No portion of the proposed multi-use trail would be within the floodway. As a condition of approval signage would be provided discouraging use during storm events and notifying users of flooding potential.
Objective 7.3: Provide adequate lighting along the trail and in open spaces that balances public safety needs with natural habitat requirements.	**Consistent.** Any lighting along the multi-use trail would be the minimum necessary consistent with public safety needs, and would not be expected to result in habitat disturbance. This will be conditioned as part of SPAR consistent with MM Bio-7A.
Integrated Development	

Table 12-2: Project Consistency with City of Petaluma Policies

Relevant Goal, Policy or Program	Analysis
Objective 8.1: Treat the river as the dominant element in shaping the character and image of new development along the river.	**Consistent.** The general development pattern orients towards the center of the site, rather than towards the river. However the applicant has noted a willingness to improve this orientation, and SPAR review shall further consider project orientation to the river; see also MM Bio-10B specifying RODZ review at APN-009. The Project does incorporate a multi-use trail along the portion of the property that fronts the Petaluma River. The inclusion of a multi-use trail and intermittent viewing areas highlights the natural and aesthetic value of the river.
Objective 8.4: Integrate public access routes, as proposed by this Plan, with new development.	**Consistent.** The Project includes a multi-use trail along the Petaluma River frontage of the property, in a location generally consistent with that shown in the Petaluma River Access and Enhancement Plan.
Policy 1: Integrate the River Plan into the review process for all properties within the river corridor.	**Consistent.** The River Plan has been reviewed along with policies and programs relative to the proposed project.
Policy 2: New development should respect the river setbacks and buffer requirements specified in this Plan.	**Consistent.** Development would not result in the placement of any residential structures within 200 feet of the centerline of the Petaluma River. The River Corridor and setback buffers are achieved through MM presented in the Biological Resources Chapter.
Policy 8: Provide visual buffering and screening of parking areas from the river and the street.	**Consistent.** During SPAR, the proposed Project would be reviewed to ensure that adequate buffers and landscaping are provided around parking areas and internal streets to soften views from the multi-use trail towards the proposed Sid Commons development and existing Oak Creek Apartments.
Economic Viability Objectives	
Objective 9.4: Encourage full but appropriate uses within the river corridor.	**Consistent**. The proposed development is consistent with the land use designation for the site in the General Plan and no part of the proposed development would be within 200 feet of the centerline of the Petaluma River; with mitigation set forth in the Aesthetics and Biological Resources Chapters, the project is consistent with measures intended to provide a well-defined river corridor.
Access and Enhancement Objectives	
Objective 1: Emphasize the natural features of the greenway and landscape setting throughout the upstream river segment, integrating the riparian corridor into the site design of new development.	**Consistent**. The Project would leave most of the area adjacent to the river undeveloped (except for the proposed multi-use trail and terracing) and would not place residential structures within 200 feet of the centerline of the Petaluma River. The Habitat Mitigation Monitoring Plan (HMMP) aims to retain high priority trees and native vegetation and replanting to reestablish a riparian corridor with native species, canopy cover and wetlands. Implementation of the HMMP will ensure that natural features are sufficiently integrated into the terrace design.

Table 12-2: Project Consistency with City of Petaluma Policies

Relevant Goal, Policy or Program	Analysis
Objective 3: Protect and preserve the existing communities of mature riparian vegetation and restore and enhance native riparian and upland habitats.	**Consistent**. The Regional Water Quality Control Board has indicated, in their August 15, 2007 letter to the City of Petaluma in response to the NOP, that removal of mature oaks in both the upland and riparian areas of the Project site to enable development as proposed is **inconsistent** with this Objective. The removal of mature oaks at the Project site is also prohibited as a condition of approval of the earlier Oak Creek Apartments project across Graylawn Avenue from the Project site. Mitigation Measure Bio-11A requires the Project to achieve greater consistency with the City's River Plan by preserving protected trees, particularly those protected trees located within the Petaluma River Plan Corridor and those protected trees within the RODZ, to the greatest extent possible. While it is recognized that the preservation of all existing trees on the Project site may conflict with reasonable land development considerations, the design of the Project shall seek to preserve the most desirable and significant healthy trees on site.
Policy 3: The trail should be kept out of the Preservation and Restoration Zones and should avoid impacts to wetlands.	**Consistent**. A portion of the proposed multi-use trail would be located within a portion of the identified Preservation and Restoration Zone, although it would not pass through any identified wetland areas. The River Plan allows for the river trail location to be evaluated specific to the project and notes (at page 68) that where flood terracing occurs, the preferred trail location may well be in the artificially created flood terrace to create the sense of a "nature trail". The River Plan continues that the trail in the area will generally be at bank top, gently meandering to avoid sensitive habitat areas, but continues that, to the extent possible, the trail should take advantage of the different landscapes, moving from flood terrace meadow to bank top riparian woodlands, to maintain a focus on the natural landscape. It states that while the trail should avoid impacts to wetlands and should generally be kept out of the Preservation and Restoration Zones, a short interpretive trail may go through a portion of the Oak Grove/ Riparian Woodland and occasionally to overlooks in the Restoration Zones. In summary, the conceptual trail location does not appear inconsistent with the River Plan and the precise location will be considered in greater detail during the SPAR process.
Policy 10: Establish zones within the greenway to identify the degree of habitat restoration, creation and protection required within the channel and bank top habitat areas.	**Consistent.** The proposed Habitat Mitigation and Monitoring Plan (HMMP) identifies zones for replanting, creation of wetlands, and restoration. The HMMP sets forth maintenance specification and success criteria.
Policy 11: Allow mitigations for habitat damage caused by development activities to occur within the greenway.	**Consistent.** The proposed Habitat Mitigation and Monitoring Plan (HMMP) identifies areas for restoration, replanting and creation of wetlands within the terrace area. Wetlands created within the terrace offsets losses from fill to upland seasonal wetlands within the development area.

Table 12-2: Project Consistency with City of Petaluma Policies

Relevant Goal, Policy or Program	Analysis
Policy 12: Dense, multi-storied stands of riparian vegetation should be established along the tops of the banks.	**Consistent.** The proposed Habitat Mitigation and Monitoring Plan (HMMP) identifies zones for replanting. Zone A on top of bank calls for native tress including box elder, coast live oak, and black walnut.
Program 12a: Establish a continuous planting of native riparian and upland vegetation along the river.	**Consistent.** The planting of native riparian and upland vegetation along the river is set forth in the proposed Habitat Mitigation and Monitoring Plan.
Program 12d: Establish meadows and/or wetlands in the flood terraces.	**Consistent.** As set forth in the proposed Habitat Mitigation and Monitoring Plan (HMMP), the Project would create wetlands, benched elevations and opportunities for a variety of habitats within the flood terrace.
Program 12e: Native vegetation planted as natural communities is preferred.	**Consistent.** Proposed landscaping at the Project site would include the planting of native vegetation and removal of invasive vegetation which would aid in the restoration of the riparian corridor and serve to reestablish natural communities. The Habitat Mitigation and Monitoring Plan (HMMP) identifies the planting pallet for use in the terrace area.
Program 12f: Allow trail and maintenance access into the flood terrace.	**Consistent.** Access to the flood terrace would be provided via the proposed multi-use trail located at the top of terrace.
Program 12g: Discourage use of disruptive and damaging mechanical means of maintenance and clearing.	**Consistent.** Maintenance of the flood terrace would be provided in accordance with the Habitat Mitigation and Monitoring Plan (HMMP).
Policy 13: Create Buffer Zones on both sides of the river, measured from the top of the bank, (at time of development) to protect habitats along the river, and to provide an undeveloped area in which a trail and amenities can be located. A buffer zone setback, if and to the extent allowed by law, other than that prescribed in the following programs may be allowed where the City finds, based on substantial evidence, that the habitat and other environmental impacts of the proposed development can be mitigated, and the intent and goals of this Plan can be met, by this alternative setback.	**Consistent.** Development of the Project site as proposed would not result in the placement of any residential structures within 200 feet of the centerline of the Petaluma River. The project design provides for a buffer area that includes the terrace and multi-use trail. In general residential structures are adequately set back from the trail. Mitigation measure set forth in the Aesthetic and Biological Resource Chapter ensure that adequate buffers are established including appropriate setback from drip line of mature trees to be preserved.
Program 13j: Development shall not encroach within 50 feet of the drip line of mature oak trees.	**Consistent.** Mitigation measures set forth in the Biological Resources Chapter including MM BIO-11A through BIO-11C provide for a 50-foot buffer from the drip line of mature oak trees.

Table 12-2: Project Consistency with City of Petaluma Policies

Relevant Goal, Policy or Program	Analysis
Program 13k: Tributary streams and seasonal wetlands shall have a minimum 50'-buffer from the top of bank or edge of the wetland.	**Consistent.** Development of the Project site as proposed would result in the filling of 0.34 acres of seasonal wetlands. The Project does not propose any building within 50 feet of the 0.28 acres of existing seasonal wetlands to be preserved, and MM Bio -10A ensures a 50' buffer from the edge of this existing wetlands. A bench and the multi-use path are proposed less than 50 feet from existing and proposed wetlands. However, sensitive habitat signage, design features and interpretive signs will discourage direct access into sensitive habitat areas including the restoration and replanting zone and wetlands.
Preservation Zones	
Policy 14: Establish a Preservation Zone for the remnant Oak Grove/Riparian Woodlands upstream of Lynch Creek.	**Consistent.** The development plan as proposed would result in the removal of mature oak groves on the Sid Commons site. However, MM BIO-9 through BIO-11 provide for the protection of mature trees onsite and replanting of trees to offset removal of mature oaks.
Program 14a: Prohibit development of any kind in the Preservation Zone, allowing only a short, low-impact interpretive trail.	**Consistent.** Only the multi-use trail (interpretive trail) would be located within the Preservation Zone.
Program 14b: Restore the habitat in the Preservation Zone, with appropriate native riparian and upland vegetation.	**Consistent.** The Preservation Zones at the Project site, as shown in **Figure 12-6**, 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), pursuant to the River Plan including pages 64, 77 and 195. The project proposes to remove non-native vegetation located in the preservation zone and retain high priority trees and native vegetation. The terracing component would re-contour the riverbank and the Habitat Mitigation and Monitoring Plan (HMMP) would reestablish native plantings.
Policy 17: Runoff should not flow directly from developed areas into the river without some filtration.	**Consistent.** The Project incorporates design features which would provide on-site filtration of runoff prior to release into the river. In accordance with LID requirements and City standards runoff will be directed to graded swales in order to provide passive filtration. In areas that do not discharge directly into a passive system, filter inserts will be installed in drainage structures.
River Oriented Development Zone (RODZ)	
Policy 18: New development should emphasize its location on the greenway, and encourage awareness and enjoyment of the river and use of the trail system.	**Consistent.** The proposed multi-use trail is proposed to extend along the length of the river at the site frontage. Mitigation set forth in the Biological Resources Chapter including BIO-10 A and BIO-10B specifically preclude buildings within the River Plan Corridor and requires that SPAR evaluate RODZ consistency.

Table 12-2: Project Consistency with City of Petaluma Policies

Relevant Goal, Policy or Program	Analysis
Policy 19: Place particular emphasis on the integration of river access and river-oriented activity areas in the city review of future riverside developments.	**Consistent.** The project will be reviewed through the SPAR process to ensure that development orients towards the river and maximizes integration in accordance with Measure BIO-10B.
Program 19a. Integrate new development with the natural landscape and river features by limiting building scale and coverage; encouraging building separation and clustering; and requiring adequate river setbacks, appropriate materials and colors, and appropriate, compatible landscaping.	**Consistent.** The preliminary development concept presents a clustering of buildings and uses a similar scale and coverage as the existing Oak Creek apartments. In addition the project is consistent with the General Plan Land Use Designation of Medium Density Residential. Further, in accordance with the Measures set forth in the Biological Resources Chapter including BIO-10A and BIO-10B the Preservation, Restoration and Buffer Zones will be maintained in accordance with the River Plan and the SPAR process shall include evaluation and review of the Project for consistency with River Oriented Development Zone (RODZ) policies and design guidelines.
Policy 20. Protect, restore and enhance areas of fragile habitat isolated in the RODZ, such as oaks, and seasonal wetlands, whenever feasible.	**Consistent.** The proposed development would result in the removal of fragile habitat including 0.32 acres of wetlands and mature riparian oaks. However, the Biological Resources Chapter and the HMMP provide measure to avoid, restore and enhance fragile habitats and resources including wetland and mature oaks.
Public and Private Trail Connections	
Program 23c: Provide a short spur trail to points of special interest, such as the wetland north of the Oak Creek Apartments, taking care not to disturb sensitive habitat.	**Consistent.** With development of the Project site as proposed, the wetland identified north of the Oak Creek Apartments would be retained and incorporated into the terrace design. However, no spur trail would be developed as the main trail segment would be located in close proximity and could provide viewing and special interest signage as part of improvements.
Flood Protection	
Policy 25: In flood channel design, balance the needs for habitat restoration and natural channel configurations with the goals of flood protection and maintaining the economic viability of properties.	**Consistent**. The proposed terracing and restoration component is designed to balance the needs of habitat and flood protection. No residential structures are proposed within an identified flood hazard zone or within an identified floodplain.
CITY OF PETALUMA BICYCLE AND PEDESTRIAN PLAN	
Policy 1: Implement the bikeway system as outlined in the Bicycle and Pedestrian Plan and expand and improve the bikeway system wherever the opportunity arises.	**Consistent.** The project provides for an off trail path along the river that connects to the existing trail in the project vicinity.
Policy 4: The City shall require Class II bike lanes on all new arterial and collector streets.	**Consistent.** As proposed, the Shasta Ave. at grade crossing to the Sid Commons property would be improved to include Class II bike lanes.
Policy 5: All new and redesigned streets shall be bicycle and pedestrian friendly in design.	**Consistent.** The proposed project incorporates bicycle and pedestrian facilities as part of the proposed design.

Table 12-2: Project Consistency with City of Petaluma Policies

Relevant Goal, Policy or Program	Analysis
Policy 8: Preserve and enhance pedestrian connectivity in existing neighborhoods and require a well-connected pedestrian network linking new and existing developments to adjacent land uses.	**Consistent.** The project provides for a multi-use trail along the river and would be conditioned to ensure that sidewalks and pedestrian paths connects directly to existing facilities in the project vicinity.

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. Physically divide an established community
2. Conflict with any applicable land use plan, policy or regulation of an agency with jurisdiction over the Project
3. Conflict with any applicable habitat conservation plan or natural community conservation plan

Dividing Established Community

Division of an established community typically occurs when a new physical feature, in the form of an interstate or railroad, physically transects an area, thereby removing mobility and access within an established community. The division of an established community can also occur through the removal of an existing road or pathway, which would reduce or remove access between a community and outlying areas.

There are no aspects of the Project that would substantially reduce mobility or access. The Project would involve construction of a residential complex on a vacant site located on the periphery of an area that has previously been developed for residential use. Development of the subject site as proposed, PUD amendments and the rezone from PUD to R4 is consistent with the surrounding established uses. Therefore, the project would have less than significant impacts due to the division of an established community.

Conflict with Plans and Policies

LU-1 **Conflict with Petaluma River Access and Enhancement Plan:** Development of the Project site as proposed would result in the filling of areas identified as "wetlands" within the River Oriented Development Zone (RODZ) in the Petaluma River Access and Enhancement Plan, and would result in the removal of mature oak trees at the site. This would be in conflict with objectives, policies and programs identified in the Petaluma River Access and Enhancement Plan. (**Less than Significant with Mitigation**)

The Project is required to comply with all City policies and regulation including those set forth in the 2025 General Plan, the Bicycle and Pedestrian Plan, the Petaluma River Access and Enhancement Plan and the Implementing Zoning Ordinance.

2025 General Plan

The density that would be accommodated by the proposed re-zoning would achieve General Plan goal 1-P-1, which encourages the efficient development of underutilized lands through infill that is equal to or higher than that of surrounding land uses and would be consistent with the Medium Density land use designation of the site as shown on the General Plan Land Use Map. As such, approval of the project would result in a residential density consistent with the City's General Plan 2025 land use designation for the property.

General Plan 2025 identifies a future 7-acre community park on the 49.03-acre Johnson property that is on the east side of the Petaluma River (at APN 135-100-025) (which is a portion of the remainder parcel of the proposed TPM and an ancillary component of the "All Involved Lands" of the project. This future park area is across the Petaluma River from the Project site and not currently proposed for development. At the time that the Johnson property on the east side of the river is submitted for development review, a thorough evaluation of consistency with the 7-acre community park will be conducted.

The proposed Project will introduce a public multi-use trail along the Petaluma River in compliance with the River Access and Enhancement Plan and the Petaluma Bicycle and Pedestrian Plan. This facility is expected to meet some of the recreational need generated by new residents onsite and will introduce a new amenity along the river that will be accessible to the public. Additionally, the project is required to contribute fees that are used by the City for both Open Space and Park Land Acquisition. Further, the City collects a Park Land Development Impact Fee, the purpose of which is to provide funding for adequate community park and neighborhood park facilities to meet the needs of Petaluma residents. Therefore, the subject project would have less than significant impacts due a conflict with the insufficient parklands.

Implementation of mitigation measures listed throughout this document ensures consistency with applicable land use policies, zoning requirements, and ordinances.

Implementing Zoning Ordinance

The Project includes a re-zone from PUD to R4 and a PUD amendment in order to remove restrictions placed on the development potential of the property at the time the Oak Creek Apartments were approved. The rezone and amendment to the Oak Creek PUD would ensure project consistency with the IZO.

The larger, northern portion of the Project site (APN -009) is within the previously approved Oak Creek PUD. Future development of this area is currently subject to the 1982 Oak Creek Apartments Conditions of Approval. One of the conditions in the Oak Creek Apartments PUD specified that future land uses on the undeveloped portion (APN -009) of the site would be limited to uses permitted in the Agricultural District. The Agricultural zoning classification is "…applied to areas that are actively and primarily used for grazing, or the production for sale of food and fiber. Areas subject to seasonal or historic flooding and identified by FEMA as areas warranting special consideration are included."

The smaller, southern portion of the Project site (APN -006) has the same General Plan land use designation as the northern portion of the Project site (Medium Density Residential) and is zoned R-4. The R-4 residential zoning district is "…applied to areas intended for a variety of housing types ranging

from single dwellings to multi-unit structures. Densities range from 8.1 to 18.0 units per acre. The R-4 zone is consistent with and implements the Medium Density Residential land use classifications of the General Plan."

The Project Applicant is seeking to rezone APN -009 from the Oak Creek Apartments Planned Unit District (PUD) to R4 to allow the development of a 278-unit apartment complex, within three-story structures, along with a clubhouse and swimming pool on approximately 15.45 net developable acres, at a density of 18.0 units per developed acre. The application request also includes a vesting tentative parcel map. Because the Applicant intends to develop APN -009 and to use Graylawn Avenue as a second major access (contrary to the conditions of approval for the Oak Creek Apartments), approval of the Project will require an amendment to the prior Oak Creek Apartment PUD.

Given that the whole Project site has the same General Plan designation of Medium Density Residential, the R-4 zoning designation of APN -006 and the proposed re-zoning of APN -009 to R-4 is consistent with the General Plan.

Chapter 6 of the IZO also establishes regulations for the Floodway and Floodplain Districts, which is applicable to those portions of the Project site proximate to the river. The intent of the Floodway and Floodplain Districts is to minimize property damage from floodwaters and protect human life and health. The Petaluma River Basin Flood Plain and Floodway Areas are defined as those areas of Special Flood Hazard identified by the Flood Insurance Rate Maps, the latest of which became effective on February 19, 2014.

The Area of Special Flood Hazard means the land in the flood plain within a community subject to a one percent or greater chance of flooding in any given year. Floodway (also referred to as regulatory floodway) means the channel of a river or other watercourse and the adjacent land areas that must be reserved in order to discharge the base flood without cumulatively increasing the water surface elevation more than one (1) foot. All areas within the boundaries of the "Area of Special Flood hazard" but outside the "Floodway" areas are zoned to the (FP-C) Flood Plain-Combining District. All areas within the boundaries of the "Areas of Special Flood Hazard" and identified as "Floodway" areas are zoned to the FW (Floodway) Zone.

Portions of the Project site are located within areas currently designated as Flood Plain Combining District and Floodway Zone, based on the current Federal Emergency Management Agency mapping.

Proposed development in these areas is limited to a new multi-use trail and a flood terrace (to be constructed in compliance with the City's "zero net fill" policy). No structures are proposed within these designated flood areas, which is consistent with the provisions of the applicable portions of the Implementing Zoning Ordinance (Chapter 6) and the General Plan (Chapter 8).

Conflict with Conservation Plan

Although there are no formal habitat conservation plan or natural community conservation plan that have been adopted for the City of Petaluma, for the purposes of this discussion the conservation goals set forth in the City's Petaluma River Access and Enhancement Plan is used to assess consistency. The Petaluma River Access and Enhancement Plan is an integral part of the City's General Plan (the General Plan notes at page 4-4), and development of the Project site as proposed has the potential to conflict with objectives, policies and programs identified in that Plan.

The Petaluma River Plan identifies a portion of the Project site near the Petaluma River as "Oak Grove/Riparian Woodland Preservation Zone". The Project proposes removal of mature oak trees from this portion of the Project site (see **Figure 12-6**), and the encroachment of proposed development within

50 feet of mature oak trees within this area, and would be in conflict with programs identified in that Plan.

The Petaluma River Access and Enhancement Plan shows seasonal wetlands on APN -009, and Program 23c (page 81) states that care should be taken not to disturb this sensitive habitat. Filling of areas identified as wetlands at the Project site is in direct conflict with this policy. While the large wetland near the river (0.28 acres) is preserved by the terracing plan, the very small wetland (0.01 acres) in the terrace is not protected and the 0.33 acres of relatively isolated wetlands are proposed to be filled and mitigated (along with the 0.01-acre wetland) on-site closer to the River, within the flood terrace. The wetland features identified on the Project site in the Petaluma River Access and Enhancement Plan are within the boundaries of the River Oriented Development Zone (RODZ) and, therefore, subject to RODZ policies, including Policy #20: "Protect, restore and enhance areas of fragile habitat isolated in the RODZ, such as oaks and seasonal wetlands, whenever feasible." The filling of these wetlands, and removal of mature oaks in order to develop the Project site as proposed, would conflict with this Policy.

It should be noted that the U.S. Army Corps of Engineers has determined that the areas shown as wetlands within the RODZ in the Petaluma River Access and Enhancement Plan are regarded as wetlands within Corps jurisdiction under Section 404 of the Clean Water Act, and these areas may also be considered "waters of the State" under Section 401 of the Clean Water Act, and may be subject to regulation by the Regional Water Quality Control Board. As described in Chapter 6: Biological Resources, Mitigation Measure Bio-4 is provided in order to minimize impacts and offset losses to wetlands, which may be accomplished through onsite restoration associated with the terracing component of the Project.

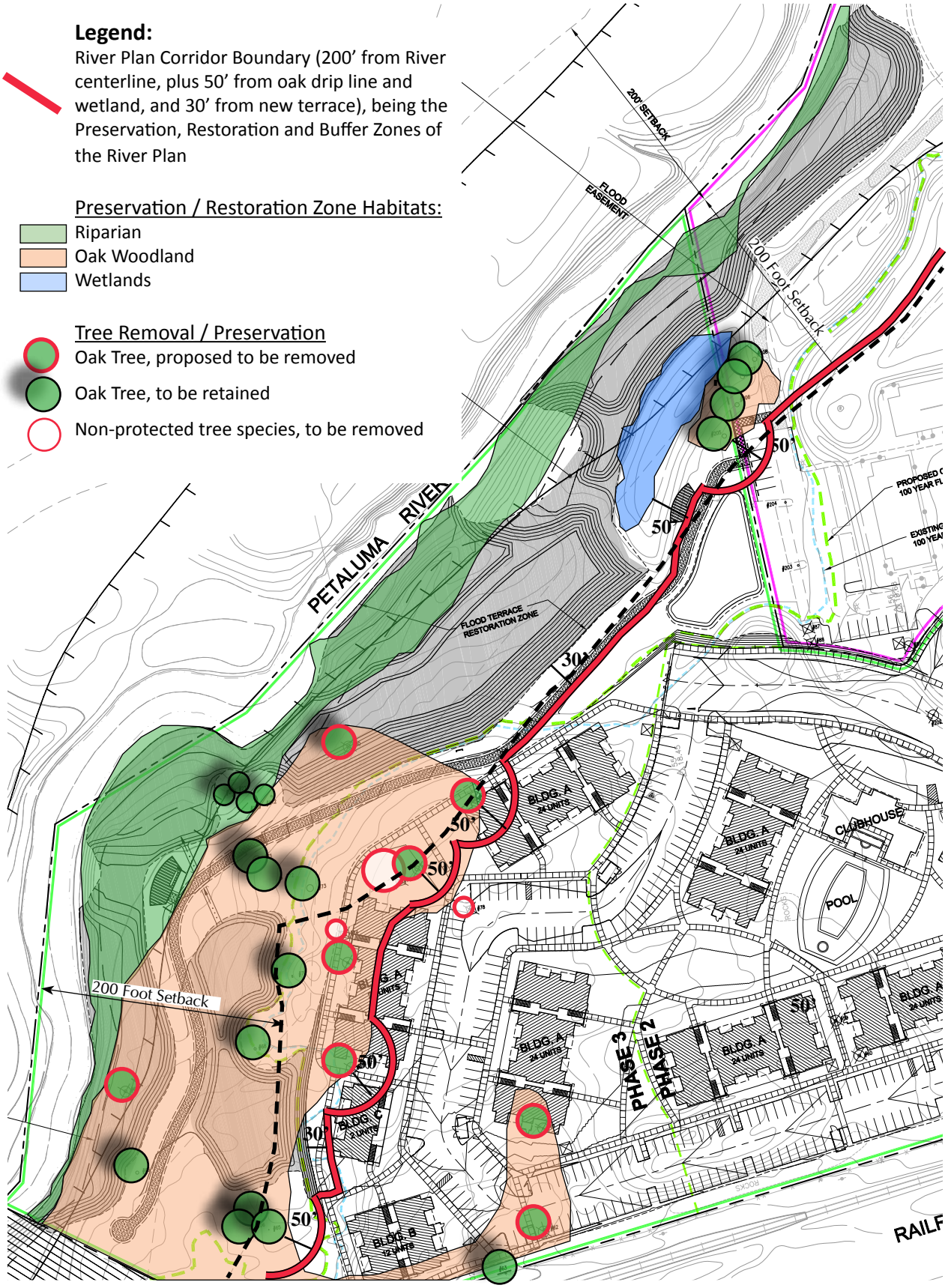


Figure 12-6
Project's Comparison to Petaluma River Plan Corridor

The removal of mature oaks in both the upland and riparian areas of the Project site to enable the Project as proposed is inconsistent with Objective #3 of the Petaluma River Access and Enhancement Plan Upstream Segment to "Protect and preserve the existing communities of mature riparian vegetation and restore and enhance native riparian and upland habitats." The Water Board also indicates that the removal of mature oaks at the Project site is also prohibited as a condition of approval of the earlier Oak Creek residential development project across Graylawn Avenue from the Project site.

Mitigation Measure

The following Mitigation Measures for the Project set forth in throughout this DEIR, primarily in Chapter 6: Biology, would mitigate impacts to biological resources and would serve to minimize conflicts with objectives, policies and programs of the Petaluma River Access and Enhancement Plan:

- **Mitigation Measure Bio-4: Compensation for Seasonal Wetlands Fill:** This mitigation measure requires the Project applicant to provide on-site compensatory mitigation for fill of seasonal wetlands sufficient to achieve a no-net-loss standard (subject to additional requirements of the permitting agencies), providing new, higher quality wetlands habitat value than the low value habitat lost as a result of Project's fill and terrace grading.
- **Mitigation Measure Bio-5A: Riparian Preservation Zone:** This mitigation measure requires the final grading plans for the Project's proposed terraced grading concept along the Petaluma River to include a Riparian Preservation Zone of a minimum of 0.30 acres in size, where the preservation of existing high quality riparian vegetation shall be achieved. Whereas the River Plan calls for all development 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 (with minimal intrusions in a carefully selected location that could be authorized by the City for interpretive purposes only.)
- **Mitigation Measure Bio-5B: Riparian Tree Preservation:** This mitigation measure requires special measures to be implemented to protect riparian and oak woodland trees within and abutting the riparian zone (and 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.
- **Mitigation Measure Bio-5C: Habitat Mitigation and Monitoring Plan:** This mitigation measure requires that a final Habitat Mitigation and Monitoring Plan (HMMP) be submitted for review and approval by the regulatory agencies and the City, designed and constructed such that it contributes significantly to the wildlife and fishery habitat values and water quality of the greenway.
- **Mitigation Measure Bio-6: Terraced Grading Erosion Control/Stormwater Pollution Prevention Plan:** This mitigation measure requires the Project applicant to 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.
- **Mitigation Bio-9: Incorporation of Native Plants in Landscaping Plans:** This mitigation measure requires the Project applicant to submit a Landscape Plan for review and approval by the City, incorporating the 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.
- **Mitigation Measure Bio-10A: Preclude Residential Development from intruding into the Petaluma River Plan Corridor** (also listed as Mitigation Measure Visual-2): This mitigation precludes any

residential component of the Project from extending into the Petaluma River Plan Corridor, which is comprised of the Preservation, Restoration, and Buffer management zones of the River Plan. The only Project components that are allowed with the Corridor include the trail, terracing and restoration.

- **Mitigation Measure Bio-10B: RODZ review at SPAR:** This measures provides for the Site Plan and Architectural Review process to include an evaluation and review of the Project for consistency with River Oriented Development Zone (RODZ) policies and design guidelines, specifically such that the northern portion of the Project that is within the RODZ be designed pursuant to the RODZ Guidelines.
- **Mitigation Measure Bio-11A: Further Preservation of Existing Trees:** This mitigation measure requires that the residential portion of the Project be redesigned to better achieve the goal of preserving protected trees, particularly those protected trees located within the Petaluma River Plan Corridor (including the oak woodland habitat along the river, and those isolated oaks within the RODZ), to the greatest extent possible. While it is recognized that the preservation of all existing trees on the Project 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.
- **Mitigation Measure Bio-11B: Protected Tree Replacements:** This mitigation measure requires the project applicant to provide replacement trees for all protected trees permitted by the City to be removed.
- **Mitigation Measure Bio-11C: Tree Protection Plan:** This mitigation measure requires the project applicant to prepare a tree protection plan that provides all trees designated for preservation with a good chance of long-term survival, consistent with the recommendations of a licensed landscape architect, arborist or certified forester and approved by the City.

Resulting Level of Significance

With implementation of these mitigation measures as listed above, the Project would need to be modified by removing any residential component of the Project from extending into the Petaluma River Plan Corridor (including the Preservation, Restoration and Buffer management zones of the River Plan), and would be required to implement further measures that would ensure greater consistency with the objectives, policies and programs of the Petaluma River Access and Enhancement Plan. Implementation of these mitigation measures would reduce potential conflicts with the Petaluma River Access and Enhancement Plan to a level of ***less than significant***.

13

Noise

The following chapter of this EIR provides an analysis of noise impacts resulting from implementation of the Project. This chapter provides the results of ambient noise measurements at the Project site, an assessment of potential noise impacts associated with construction activities, new onsite land uses, increased traffic, and an assessment of off-site noise sources potentially affecting the Project. The information presented in this chapter of the EIR has been derived from the following primary sources:

- Illingworth & Rodkin, Inc. (I&R), *Oak Creek II Environmental Noise Assessment*, January 7, 2004
- Peer review and update to the I&R Environmental Noise Assessment by Geier & Geier, noise consultants to the City of Petaluma; 2008
- *Environmental Noise Assessment, NCRA RRD Freight Rail Project* prepared by Ballard Acoustical Consultants, Inc., May 8, 2008
- Sonoma-Marin Area Rail Transit District (SMART), *Passenger Rail Project EIR*, prepared by Aspen Environmental Group, July 2008
- North Coast Railroad Authority (NCRA) *Freight Rail Project EIR*, prepared by Kleinfelder Associates, November 5, 2009
- City of Petaluma, Petaluma General Plan 2025 and associated EIR; and City of Petaluma, Implementing Zoning Ordinance

Physical Setting

Noise Definitions

Sound is characterized by various parameters that describe the rate of oscillation of sound waves, the distance between successive troughs or crests, the speed of propagation, and the pressure level or energy content of a given sound. The sound pressure level has become the most common descriptor used to characterize the loudness of an ambient sound. The decibel (dB) scale is used to quantify sound intensity. Because sound can vary in intensity by over one million times within the range of human hearing, a logarithmic loudness scale is used to keep sound intensity numbers at a manageable level. Since the human ear is not equally sensitive to all sound frequencies within the entire spectrum, human response is factored into sound descriptions in a process called "A-weighting," expressed as "dBA." The dBA, or A-weighted decibel, refers to a scale of noise measurement that approximates the range of sensitivity of the human ear to sounds of different frequencies. On this scale, the normal range of human hearing extends from about 0 dBA to about 140 dBA. The noise levels presented herein are expressed in terms of dBA, unless otherwise indicated. **Table 13-1** shows some representative noise sources and their corresponding noise levels in dBA.

Table 13-1: Typical Sound Levels Measured in the Environment (dBA)

Examples of Common, Easily Recognized Sounds	Decibels	Subjective Evaluations
Near Jet Engine	140	
Threshold of Pain	130	Deafening
Threshold of Feeling – Hard Rock Band	120	
Accelerating Motorcycle (at a few feet away)	110	
Loud Horn (at 10 feet away)	100	
Noisy Urban Street	90	Very Loud
Noisy Factory	85 [1]	
School Cafeteria with Untreated Surfaces	80	
Lawn Mower	70 [2]	Loud
Near Freeway Auto Traffic	60 [2]	
Average Office	50 [2]	Moderate
Soft Radio Music in Apartment	40	
Average Residence Without Stereo Playing	30	Faint
Average Whisper	20	
Rustle of Leaves in Wind	10	
Human Breathing	5	Very Faint
Threshold of Audibility	0	

Notes: 1: Continuous exposure above 85 dBA is likely to degrade the hearing of most people.

2: Range of speech is 50 to 70 dBA.

Source: U.S. Department of Housing and Urban Development, Office of Community Planning and Development, 1985

Noise attenuates as a function of the distance between the source and receptor. For sources of noise emanating from a single location (i.e., point sources), noise attenuates at a rate of approximately 50 percent for each doubling of distance from the source. This is the “inverse square law.” This approach tends to underestimate attenuation, and therefore provides a “worst-case” estimate of noise at the receptor.

Time variations in noise exposure are typically expressed in terms of a steady-state energy level (called L_{eq}) that represents the acoustical energy of a given measurement. L_{eq} (24) is the steady-state energy level measured over a 24-hour period. L_{10} is the noise level that is exceeded 10 percent of the

measurement period. Because community receptors are more sensitive to unwanted noise during the evening and at night, an artificial dBA increment is added to quiet time noise levels and the 24-hour noise descriptor with these added increments is called the day-night noise level (L_{dn}), which adds 10 dBA during the night hours (10:00 PM to 7:00 AM). Another 24-hour noise descriptor, called the Community Noise Equivalent Level (CNEL) is similar to L_{dn}, but adds 5 dBA during the evening hours (7:00 PM to 10:00 PM). While both add a 10-dBA penalty to all nighttime noise events between 10:00 PM and 7:00 AM, L_{dn} does not add the evening 5-dBA penalty. In practice, L_{dn} and CNEL usually differ by less than 1 dBA at any given location for transportation noise sources. L_{dn} is the more commonly used measurement in local plans, and is used for comparison purposes, below.

Table 13-2 provides definitions of acoustical terminology relevant to this study.

Table 13-2: Relevant Acoustical Terminology

Ambient Noise	The distinctive acoustical characteristics of a given environment consisting of all noise sources audible at a given location. In many cases, the term ambient is used to describe an existing or pre-project condition such as the setting in an environmental noise study.
A-Weighting	A frequency filter that conditions a given sound signal to approximate human hearing response.
CNEL	Community Noise Equivalent Level. Defined as the 24-hour average noise level with noise occurring during evening hours (7 - 10 p.m.) weighted by a factor of three and nighttime hours (10 p.m. - 7 a.m.) weighted by a factor of 10 prior to averaging.
Decibel or dB	A Bel is defined as the logarithm of the ratio of the sound pressure squared over the reference pressure (20 µPa) squared. A Decibel is one-tenth of a Bel.
Frequency	The measure of the rapidity of alterations of a periodic signal, expressed in cycles per second or hertz (Hz)
Ldn	The day/night average level. Similar to CNEL but with no evening weighting. The hours of 7–10 p.m. are considered daytime
Leq	Equivalent or energy-averaged sound level.
Lmax	The highest root-mean-square (RMS) sound level measured over a given period of time.
Ln	The measured sound pressure level exceeded (n) percent of the time
SEL	A single-number rating indicating the total energy of a discrete noise event compressed into a 1-second time duration

Existing Noise Environment

The predominant source of noise in the Project vicinity is motor vehicle traffic traveling on the U.S. 101 freeway and local streets, including Petaluma Boulevard. Long-term noise measurements collected at the Project boundaries indicate that the Project site is subject to noise levels of approximately 62 dBA

(L_{dn}) in the central portion of the site (near the end of Graylawn Avenue, location ST-5 on Figure 13-1) and 55 dBA (L_{dn}) on the western Project boundary (near the rail line, location ST-4 on Figure 3-1).[1]

Although the U.S.101 freeway is located approximately one-fourth mile northeast of the Project site, it is visible and at-grade with the site. Therefore, freeway noise influences the noise environment over most of the site (as indicated by the higher noise level measured in the central portion of the site). In contrast, where slight variations in site topography block freeway noise, noise levels were found to be quieter (as indicated by lower noise levels measured near the western project boundary, at location ST-4).

Measurement results are summarized in **Table 13-3**. Noise measurement locations are indicated on **Figure 13-1**.

Table 13-3: Summary of Existing Noise Measurement Results

Time	Hourly Noise Level (L_{eq}) Measurement Location ST #5: End of Graylawn		Hourly Noise Level (L_{eq}) Measurement Location ST #4: Northerly Portion of Site	
	AM	PM	AM	PM
12:00 to 1:00	51.9	51.0	45.6	51.4
1:00 to 2:00	49.9	50.4	46.4	50.7
2:00 to 3:00	51.9	57.5	43.6	50.9
3:00 to 4:00	54.5	50.0	46.3	53.0
4:00 to 5:00	57.7	50.5	47.8	56.1
5:00 to 6:00	56.9	51.5	52.1	52.3
6:00 to 7:00	60.2	52.8	51.2	52.3
7:00 to 8:00	58.9	53.7	54.2	47.9
8:00 to 9:00	62.0	52.8	53.1	46.7
9:00 to 10:00	55.9	49.7	51.7	46.3
10:00 to 11:00	49.3	51.0	48.9	43.0
11:00 to 12:00	50.5	49.6	49.6	44.1
L_{dn}	61.6		55.1	

Note: Measurements were taken from midnight to midnight on Thursday, October 25, 2007 using Quest Sound Pro DL and Microsonics db-308 sound level meters.

Source: Geier & Geier Consulting, Inc. (2008)

[1] Geier & Geier Consulting, Inc., 2008

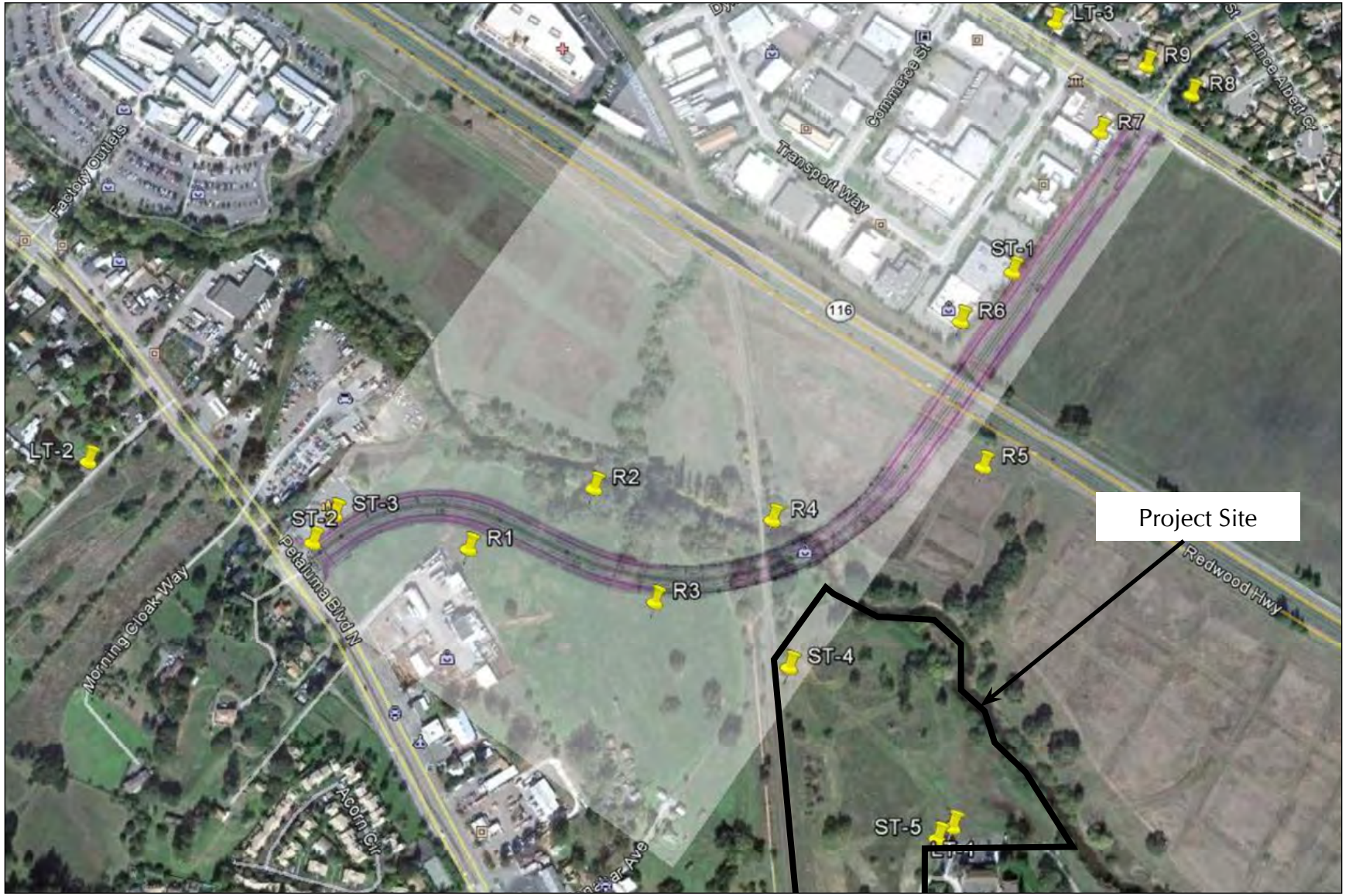


Figure 13-1
Noise Measurement Locations

Source: City of Petaluma, Rainier Avenue Cross Town Connector Project Draft EIR, Figure 4.9-1

Rail Noise

The railroad tracks adjacent to the site are currently in operation by the Northwest Pacific Railroad Company, which renewed rail freight service between Lombard/Napa Junction and Windsor, California in 2011, after having been fully closed down since 1999. As a commercial freight service, the schedule of trains is not regular but ranges from three trips weekly, to up to three round-trip freight train operations per day along this route. Train noise associated with this renewed freight service has not been measured at the Project site (the majority of current freight trains do not run past the Project site, but terminate at businesses south of the Project site), but calculations of the existing noise conditions associated with this train service has been estimated based on information from the North Coast Railroad Authority Freight Rail Project EIR.[2]

As a maximum or "worst-case" existing condition, it is assumed that three round-trip freight train operations pass by the Project site each day, serving commercial/industrial customers along the line. The maximum existing condition assumption is that two of these round-trip freight train operations occur along the length of the rail line (from Willits in Mendocino County to Lombard in Napa County), and an additional round-trip freight operation occurs between Santa Rosa and Lombard. The assumption is that two of these trains include 2 locomotives and approximately 60 cars, while one would include 1 locomotive and 10-25 cars.[3] Noise produced by the pass-bys of these trains can be calculated based on the following data, and the methodology documented in the Federal Transportation Administration (FTA) Guidance Manual as adopted by the Federal Railway Administration: [4]

- Reference (or standardized) noise levels for each locomotive and rail car, at a distance of 50 feet from the center of the tracks, have been established by measurements to be 96 dB SEL for locomotives, and 85 dB SEL for rail cars.[5]
- Using the reference noise levels and operations data, equations provided in the FTA Guidance Manual have been used to calculate hourly energy-averaged sound levels (Leq), which can then be converted to day/night average noise levels (Ldn).
- Based on the Ldn noise exposure, the noise levels for pass-by trains at a distance of 50 feet from the tracks was then calculated.

The results of this calculation indicate that train pass-bys at a frequency of 3 round trips per day (or 6 pass-bys per day) results in an Ldn of 61.6 dB at 50 feet from the tracks. Beyond 50 feet, Ldn levels are less than 61.6 dB Ldn.

Sonoma Marin Area Rail Transit (SMART) commuter trains received authorization to begin full passenger train service on August 25, 2017. The schedule consists of 17 round trip diesel multiple unit trains (DMUs) each weekday and 5 round trip trains each weekend, running between the Sonoma County Airport north of Santa Rosa and San Rafael. Thus, 34 SMART trains pass the Project site each weekday. Although the noise measurements taken at the Project site do not reflect the passenger train service

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2 North Coast Railroad Authority (NCRA) *Freight Rail Project EIR*, prepared by Kleinfelder Associates, November 5, 2009

3 Bollard Acoustical Consultants, Inc., Appendix H to the NCRA Rail Project EIR, *Environmental Noise Assessment NCRA RRD Freight Rail Projec*t, May 2008, page 1

4 Federal Transportation Administration, *Guidance Manual regarding Transit Noise and Vibration Impact Assessment*, April 1995/May 2006, Chapter 6

5 Bollard Acoustical, 2008, page 15

that began in 2017, analysis of the noise effects of expanded rail service along this line is provided in Impacts Noise-1 and Noise-2, later in this chapter of the EIR.

Traffic Noise

Using noise modeling techniques specified by the Federal Highway Administration (FHWA–RD–77–108), with updated California Vehicle Noise Emission [CALVENO] factors and existing traffic volumes as presented in this EIR, noise modeling was conducted for numerous street segments within the general Project area, as presented below in **Table 13-4**.

Table 13-4: Existing Traffic Noise on Selected Roadways

Road Link	Existing
Petaluma Blvd. (north of Shasta Ave)	68.9
Petaluma Blvd. (south of Shasta Ave)	68.9
Sycamore Ave. (east of Petaluma Blvd)	54.1
Shasta Ave. (east of Petaluma Blvd)	53.0
Graylawn Ave. (north of Payran St)	52.8
W. Payran St. (west of Graylawn Ave)	63.5
W. Payran St. (east of Graylawn Ave)	63.2
Payran St. (north of E. Washington St)	61.5
Payran St. (south of E. Washington St)	61.3
East Washington St. (east of Payran St)	68.2

Source: Geier & Geier Consulting, Inc. (2008)

Whereas traffic volumes may have changed on several of these selected roadways since the 2007 measurements and calculations, the calculated traffic noise on Graylawn Avenue (specifically) is considered representative of existing conditions, as few changes along this roadway have occurred.

Existing Sensitive Receptors

Human response to noise varies considerably from one individual to another. Effects of noise at various levels can include interference with sleep, concentration, and communication; physiological and psychological stress; and hearing loss. Given these effects, some land uses are considered more sensitive to ambient noise levels than others. Sensitive noise receptors are generally considered uses including hospitals, schools, and residences.

There are sensitive receptors located immediately adjacent to the Project site. The closest sensitive receptors are those residents living in the existing Oak Creek Apartments development, which is located contiguous to the Project site as well as those living in residences located adjacent to the south of the Project site.

Regulatory Setting

Federal, state, and local agencies regulate different aspects of environmental noise. Federal and state agencies generally set noise standards for mobile sources such as rail cars and motor vehicles, while regulation of stationary sources is left to local agencies. Local regulation of noise involves implementation of general plan policies and noise ordinance standards. Local general plans identify principles intended to guide and influence development plans; local noise ordinances establish standards and procedures for addressing specific noise sources and activities.

Federal

Federal Transit Administration

The Federal Transit Administration (FTA) publishes methodology and criteria for assessing the impact of transit projects, including vibration impact criteria for various types of land uses. The criteria are based on levels that cause interference or annoyance at a particular land use. These limits should be viewed as criteria that should be used during the environmental impact assessment phase to identify problem locations that must be addressed during final design.

The applicable noise regulations and guidelines that provide a basis for evaluating potential noise impacts are codified in Title23, Part 771 of the Code of Federal Regulations (referred to as 23 CFR sco771). Chapter 3 of the FTA's Guidance Manual regarding Transit Noise and Vibration Impact Assessment offers regulations regarding noise and vibration exposure associated with rail projects. The Federal Railway Administration (FRA) has adopted these criteria, as indicated in **Table 13-5 and Table 13-6**, below. For residential land use, the noise criteria are to be applied outside the building locations at noise-sensitive areas with frequent human use, including outdoor patios, decks, pools and play areas.[6]

[6] FTA, Transit Noise and Vibration Impact Assessment, May 2006 (pg. 3-10)

Table 13-5: Noise Levels Defining Impacts for FTA Transit Projects (Ldn dBA)

Existing Noise Exposure* Leq(h) or Ldn (dBA)	No Impact	Moderate Impact	Severe Impact
50	<54	54-59	>59
52	<55	55-60	>60
54	<55	55-61	>61
55 (Approx. ambient noise levels within the Project site, adjacent to the rail tracks)	**>56**	65-61	**>61**
56	<56	56-62	>62
58	<57	57-62	>62
60	<58	58-63	>63
62	<59	59-64	>64
64	<61	61-66	>65
66	<62	62-67	>67
68	<63	63-68	>68

Source: Transit Noise and Vibration Impact Assessment, Federal Transit Administration, May 2006

Ldn is used for land use where nighttime sensitivity is a factor

Table 13-6: FTA Ground-Borne Vibration Impact Criteria

Land Use Category	Groundborne Vibration Impact Levels (VdB re 1 micro-inch /sec)		
	Frequent Events[1]	Occasional Events[2]	Infrequent Events[3]
Category 1: Buildings where vibration would interfere with interior operations	65 VdB[4]	65 VdB[4]	65 VdB[4]
Category 2: Residences and buildings where people normally sleep	72 VdB	75 VdB	80 VdB
Category 3: Institutional land uses with primarily daytime use	75 VdB	78 VdB	83 VdB

Notes

1. More than 70 vibration events of the same source per day
2. Between 30 and 70 vibration events of the same source per day
3. Less than 30 vibration events of the same source per day
4. This criterion is based on levels that are acceptable for most moderately sensitive equipment such as optical microscopes. Vibration sensitive manufacturing or research should always require detailed evaluation to define the acceptable vibration levels. Ensuring low vibration levels in a building requires special design of HVAC systems and stiffened floors.

State

State of California Noise Insulation Standards

The California Noise Insulation Standards found in CCR, Title 24 establish requirements for new multi-family residential units, hotels, and motels that may be subject to relatively high levels of transportation noise. In this case, the noise insulation criterion is 45 dB Ldn inside noise sensitive spaces. For developments with exterior transportation noise exposure exceeding 60 dB Ldn, an acoustical analysis and mitigation (if required) must be provided showing compliance with the 45 dB Ldn interior noise exposure limit.

City of Petaluma Noise Standards and Guidelines

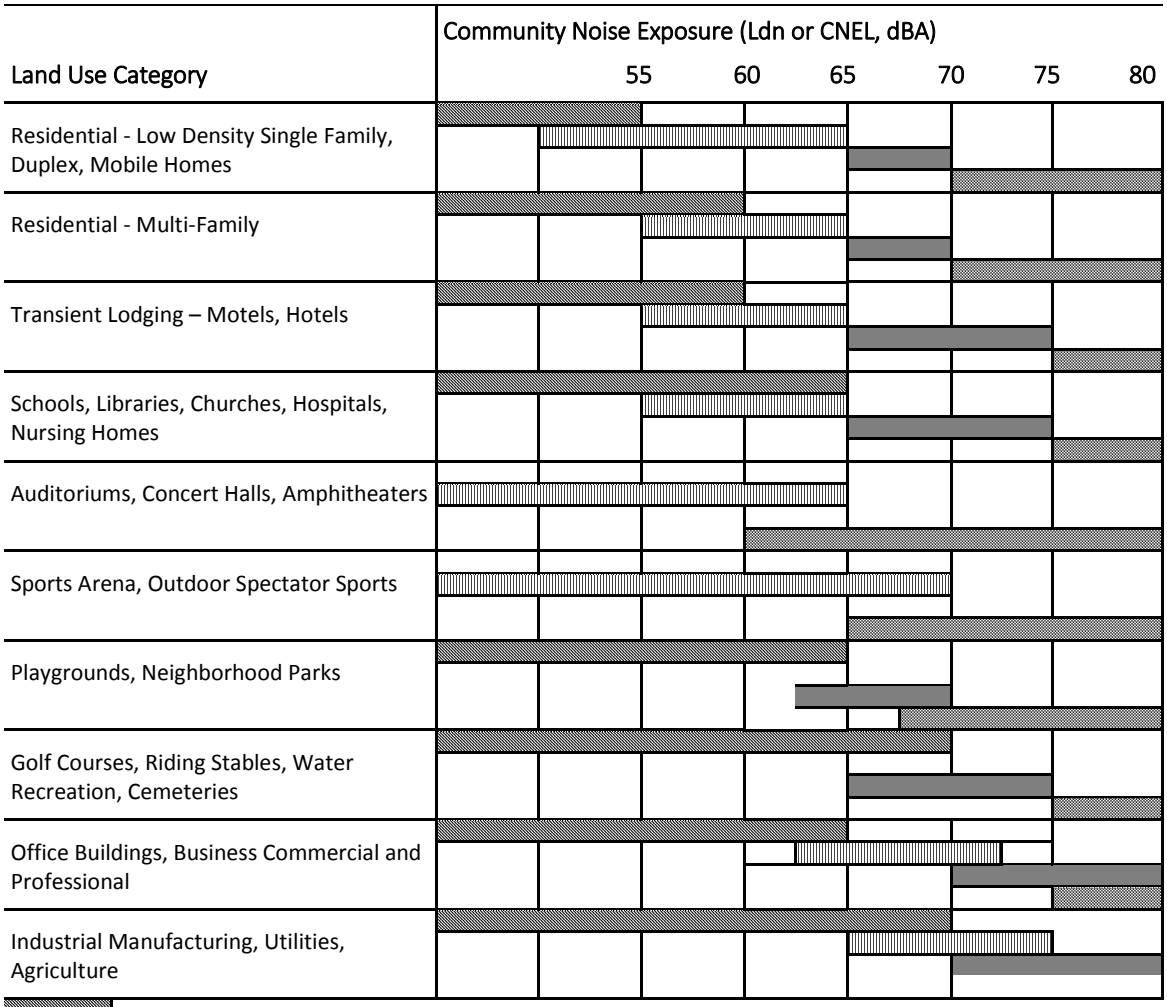
Noise exposure standards are implemented at either the receiver or the source. Standards generally fall into two categories: (1) receiver–based noise compatibility guidelines for various land uses; and (2) ordinance limits for non-transportation related noise. Since local jurisdictions are preempted from regulating noise generation from noise sources such as cars, trucks, trains, airplanes, etc., the City of Petaluma implements noise controls through receiver-based noise compatibility guidelines and its noise ordinance. The adopted noise compatibility guidelines identify allowable noise exposures for various land uses from such sources, even if the source itself cannot be regulated. The City Noise Ordinance regulates mechanical equipment, amplified sounds, and hours of heavy equipment operation.

Petaluma General Plan

The Petaluma General Plan 2025 contains policies intended to guide the development of new projects with regard to exposure to or generation of noise. The City of Petaluma's noise guidelines recognize the variable sensitivity of certain activities to noise, and establish noise exposure criteria defining acceptable noise levels.

Policy 10-P-3(E) of the Petaluma General Plan 2025 Health and Safety Element includes land use compatibility guidelines for community noise environments (see **Table 13-7**), which are also consistent with guidelines recommended by the State of California. For multi-family residences, the guidelines indicate that noise levels of up to 65 dBA (L_{dn} or CNEL) are *normally acceptable*, while noise levels between 60 and 70 dBA (L_{dn} or CNEL) are *conditionally acceptable*. Where noise levels are *conditionally acceptable*, the guidelines indicate that new development should not proceed until after a detailed analysis of the noise reduction requirements is made and needed noise insulation features are included in the design. Conventional construction, but with closed windows and fresh air supply systems or air conditioning will normally suffice in areas subject to these noise levels.

Table 13-7: Land Use Compatibility for Community Noise Environments



NORMALLY ACCEPTABLE: Specified land use is satisfactory based upon the assumption that any buildings involved are of normal conventional construction, without any special noise insulation requirements.

CONDITIONALLY ACCEPTABLE :New construction or development should be undertaken only after a detailed analysis of the noise reduction requirements is made and needed noise insulation features included in the design. Conventional construction, but with closed windows and fresh air supply systems or air conditioning will normally suffice.

NORMALLY UNACCEPTABLE: New construction or development should generally be discouraged. If new construction or development does proceed, a detailed analysis of noise reduction requirements and needed noise insulation features included in the design

CLEARLY UNACCEPTABLE; New construction or development should generally not be undertaken.

Source: California Governor's Office of Planning and Research (1990)

Other relevant policies of the General Plan 2025 include the following:

Policy 10-P-3: Protect public health and welfare by eliminating or minimizing the effects of existing noise problems, and by minimizing the increase of noise levels in the future.

a. a. Discourage location of new noise-sensitive uses, primarily homes, in areas with projected noise levels greater than 65 dBA (CNEL). Where such uses are permitted, require incorporation of mitigation measures to ensure than interior noise levels do not exceed 45 dBA (CNEL).

b. Ensure that the City's Noise Ordinance and other regulations:

    i. Require that applicants for new noise-sensitive development in areas subject to noise levels greater than 65 dBA (CNEL) obtain the services of a professional acoustical engineer to provide a technical analysis and design of mitigation measures.

    ii. Require placement of fixed equipment, such as air conditioning units and condensers, inside or in the walls of new buildings or on rooftops of central units in order to reduce noise impacts on any nearby sensitive receptors.

c. Continue to require control of noise or mitigation measures for any noise-emitting construction equipment or activity. *The City's Noise Ordinance establishes controls on construction-related noise.*

d. As part of development review, use Figure 10-2: Land Use Compatibility Standards to determine acceptable uses and installation requirements in noise-impacted areas.

e. Discourage the use of sound walls anywhere except along Highway 101 and/or along the NWPRA corridor, without findings that such walls will not be detrimental to community character. When sound walls are deemed necessary, integrate them into the streetscape.

f. In making a determination of impact under the California Environmental Quality Act (CEQA), consider an increase of four or more dBA to be "significant" if the resulting noise level would exceed that described as normally acceptable for the affected land use in Figure 10-2: Land Use Compatibility Standards.

Noise Ordinance

The City of Petaluma Implementing Zoning Ordinance, Chapter 21, section 21.040 contains the City's Noise Ordinance regulations. These Noise Ordinance regulations include the following.

A: Noise Regulations Generally. The following specific acts, subject to the exemptions provided in Section 21.040(A)(5), are declared to be public nuisances and are prohibited:

b. a. The operation or use of any of the following before 7:00 a.m. or after 10:00 p.m. daily (except Saturday, Sunday and State, Federal or Local Holidays, when the prohibited time shall be before 9:00 a.m. and after 10:00 p.m.):

    i. A hammer or any other device or implement used to repeatedly pound or strike an object.

    ii. An impact wrench, or other tool or equipment powered by compressed air.

        i. Any tool or piece of equipment powered by an internal-combustion engine such as, but not limited to, chain saw, backpack blower, and lawn mower. Except as specifically included in this Ordinance, motor vehicles, powered by an internal combustion engine and subject to the State of California vehicle code, are excluded from this prohibition.

        ii. Any electrically or battery powered tool or piece of equipment used for cutting, drilling, or shaping wood, plastic, metal, or other materials or objects, such as but not limited to a saw, drill, lathe or router.

c. No person shall cause or allow to cause, any source of sound at any location within the incorporated City or allow the creation of any noise on property owned, leased, occupied or otherwise controlled by such person, which when measured on the property where the noise disturbance is being experienced within public or private open/outdoor spaces, exceeds the noise level of Table 21.I (see **Table13-8**, below)

Table 13-8: Maximum Exterior Noise Exposure (Leq, dBA)		
	Time: 10 p.m. to 7 a.m. M-F 10 p.m. to 8 a.m. S, S and Holidays	Time: 7 a.m. to 10 p.m. M-F 8 a.m. to 10 p.m. S, S and Holidays
General Plan Ambient	60	60
Cumulative period of 15 minutes or more in one hour	65	70
Cumulative period of 5 minutes or more in one hour	70	75
Cumulative period of 1 minute or more in one hour	75	80

B: Vibration. No vibration shall be produced which is transmitted through the ground and is discernible without the aid of instruments at the points of measurement specified in Section 21.120(B) nor shall any vibration produced exceed 0.002g peak at up to fifty (50) cps frequency, measured at the point of measurement specified in Section 21.120(B) using either seismic or electronic vibration measuring equipment. Vibrations occurring at higher than fifty (50) cps frequency or a periodic vibration shall not induce accelerations exceeding .001g. Single impulse periodic vibrations occurring at an average interval greater than five (5) minutes shall not induce accelerations exceeding .01g.

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. Expose persons to, or generate noise levels in excess of standards established in the local general plan or noise ordinance. As used in this EIR, this threshold is further defined as exposing persons to, or generating noise levels in excess of:
    a. 65 dBA CNEL for multi-family residential uses, as established pursuant to the Petaluma General Plan 2025,
    b. 60 dBA Ldn, as considered normally acceptable for outdoor use in residential areas by the Federal Transit Administration for transit projects;[7] and
    c. 45 dB Ldn inside noise sensitive spaces, as established in the California Noise Insulation Standards found in CCR Title 24, which establishes requirements for new multi-family

[7] FTA Guidance Manual, 2006, Chapter3

residential units, hotels, and motels that may be subject to relatively high levels of transportation noise.[8]

2. Expose persons to, or generate excessive groundborne vibration or groundborne noise levels. As used in this EIR, this threshold is further defined as the exposure of persons to, or the generation of groundborne vibration or groundborne noise levels above 72 VdB, which is the Category 2 (residential) impact threshold established by the Federal Transit Administration for transit projects;[9]
3. Result in a substantial permanent increase in ambient noise levels in the Project vicinity above levels existing without the Project. As used in this EIR, this threshold is further defined as causing unnecessary, excessive and annoying noise disturbances as defined in City of Petaluma Zoning Ordinance (i.e. Article 22, Performance Standards; Section 22-301), established as a permanent increase in ambient noise levels of 4 dBA or more, if the resulting noise level would exceed that described as normally acceptable for the affected land use;
4. Result in a substantial temporary or periodic increase in ambient noise levels in the Project vicinity above levels existing without the Project. As used in this EIR, this threshold is further defined by the Federal Transit Administration's (FTA) construction noise impact criteria for residential land uses, which indicate a significant construction noise impact would occur during a one-hour period when noise exceeds 90 Leq (dBA), and over an 8-hour period when construction noise exceeds 80 Leq (dBA) during daytime hours.
5. Expose people residing or working in the Project area to excessive noise levels associated with airport operations.

Noise and Vibration Issues Not Further Analyzed

Due to the nature and location of the proposed Project, implementation of the Project would not have the potential to expose people residing or working in the Project area to excessive noise levels associated with airport operations. Based on noise modeling conducted at the Project site, the site is not subject to excessive airport-related noise. No further analysis of this issue is required.

Land Use Compatibility

Noise-1: The proposed Project would expose new residents to reasonably foreseeable future train noise levels in excess of the 60 dBA Ldn threshold established by the FTA for outdoor use in residential areas affected by transit projects. (**Less than Significant with Mitigation**)

Predicted Noise Conditions

Based on noise measurements collected at the Project site, freeway noise influences the site and results in existing ambient noise levels of approximately 55 to 62 dB Ldn. Future traffic volumes on the nearby freeway are expected to increase in the future, but not to an extent that noise levels at the site would exceed 65 dB CNEL. Future (2025) noise levels presented in the Petaluma General Plan indicate that

[8] California Code of Regulations, Title 24

[9] FTA Guidance Manual, 2006, Chapter 5 (see also Table 13.4, above)

future noise levels on the Project site will be 60 to 65 dBA (Ldn), which is considered to be "conditionally acceptable" for multi-family residential uses.

Pass-by freight trains on the adjacent railroad tracks produce noise levels of approximately 62 dB Ldn at 50 feet from the tracks. Beyond 50 feet from the adjacent rail tracks, Ldn levels from freight trains are generally less than 62 dB Ldn. At these existing noise levels, those portions of the Project site located beyond approximately 50 feet from the rail tracks are currently considered "conditionally acceptable" for multi-family residential use (i.e., less than 65 dB Ldn) according to the City's General Plan, and noise impacts on the Project from existing noise source are less than significant, provided that interior noise levels are maintained at levels of less than 45 dB Ldn.

However, use of the adjacent rail tracks has now expanded to include passenger rail service associated with the Sonoma-Marin Area Rail Transit (SMART) commuter/passenger train operations. According to the Environmental Noise Assessment for the *North Coast Railroad Authority (NCRA) Russian River Freight Rail Project*, freight train traffic along the segment of rail adjacent to the Project site is expected to increase to a total of 6 trains per day (5 during daytime, and 1 at night), with up to 10 locomotives and 290 freight cars.[10] Additionally, the NCRA Noise Assessment also anticipated use of the rail line for the Sonoma-Marin Area Rail Transit (SMART) commuter/passenger train operations. According to the NCRA Noise Assessment, passenger rail traffic along the segment of rail adjacent to the Project site is expected to be 24 trains per day (or 48 diesel multiple unit trains (DMUs) per day.[11] The route of passenger rail service is planned to extend north from the Santa Rosa Airport to Cloverdale, and southeast from San Rafael to the Larkspur Ferry. Additional rail stops along the current operating line are also planned in north Petaluma and downtown Novato. To accommodate the planned additional service, additional trains are also possible. The environmental reviews for expanded rail service (both freight and commuter) have been complete and both projects have been approved by their respective Authorities. Increased rail traffic has begun as of 2017, and is a reasonable and foreseeable condition along this stretch of rail adjacent to the Project site into the future.

Based on the EIR prepared for the NCRA, future noise along the rail tracks adjacent to the Project site, under a combined, cumulative scenario where both freight and SMART commuter rail services are operational at the levels described by their EIRs, noise levels would be 70 dB Ldn at 25 feet from the tracks, 65 dB Ldn at 54 feet from the tracks, and 60 dB Ldn at 117 feet from the tracks.[12] Based on City General Plan thresholds where community noise exposure of up to 65 dB Ldn is considered "conditionally acceptable", future Project residences beyond 54 feet from the tracks would not be subject to rail noise above threshold levels, but would be required to include interior insulation capable of achieving an interior noise level of 45 dB Ldn. However, based on the FTA/FRA criteria of significance as presented in Table 13-4, the increased outdoor noise related to rail service at the Project site would be considered "severe" at the point where the Ldn would reach 61 dB, at approximately 109 feet from the tracks.[13]

The Project proposes to develop new residential buildings along the westerly edge of the Project site, near the railroad tracks.

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10 Bollard Associates, Inc., 2008, Appendix A: Input Data, page 27

11 Ibid, Appendix A, page 31

12 Ibid, Appendix D, page 55 (at the nearest location modeled, the Payran Street crossing)

13 Ibid, Appendix D, page 51 (at the nearest location modeled, the Payran Street crossing)

- The nearest proposed residential building is located in the furthest northwesterly portion of the development area, approximately 50 feet from the railroad tracks. This building is located in an area that would be subject to outdoor noise levels exceeding the City's "conditionally acceptable" community noise exposure of 65 dBA, and would exceed the FTA increased noise exposure threshold for outdoor noise from transit projects at residential areas, of an increase to over 61 dB Ldn
- The second nearest proposed residential building, at the furthest southwesterly portion of the development area, is approximately 100 feet from the railroad tracks. This building is located in an area that would not be subject to outdoor noise levels exceeding the City's "conditionally acceptable" community noise exposure of 65 dBA, but would exceed the FTA increased noise exposure threshold for outdoor noise from transit projects at residential areas, of an increase to over 61 dB Ldn
- The remaining buildings proposed along westerly side of the Project site near the trail tracks are approximately 130 feet from the railroad tracks. These other proposed residential buildings are located in areas that would not exceed the City's "normally acceptable" threshold for community noise exposure, or the FTA threshold for outdoor noise at residential areas.

SMART Quiet Zone

As part of the SMART effort, the City has established "Quite Zone Standards," at all existing crossing within Petaluma, effective May 24, 2017. Quiet zones allow for the sounding of train horns to be at the operator's discretion within the designated quiet zone. Without quiet zone standards in place, train operators are required to sound the train's horn for a duration of ¼ mile when approaching an at-grade crossing. Establishment of Quiet Zones requires that all crossings within a designated quiet zone must have physical safety improvements that compensate for the loss of the train horn as a warning device. All quiet zone crossings must, at a minimum use advance-warning devices with both flashing lights and crossing gates. Train crews are still permitted to sound the horn within a Quiet Zone for railroad or safety reasons (SMART Quiet Zone, August 2012). The Quiet Zone designation does not apply to freight trains.

Mitigation Measures

To address the cumulative train noise associated with increased freight train traffic and SMART commuter rail service and to achieve "conditionally acceptable" noise levels for future residential uses, the following mitigation measure shall be implemented.

Mitigation Measure Noise 1A - Achieve "Conditionally Acceptable" Noise Levels: The Project's design shall move the residential building that is located at the northwesterly portion of the Project site inward from the rail line, such that it is no closer than the calculated 65 dB Ldn contour (i.e., at 54 feet from the railroad tracks), and within a "conditionally acceptable" noise environment. No residential structure shall be located closer than the calculated 65 dB Ldn contour.

To address the foreseeable cumulative freeway and rail noise predicted to affect the entire site (i.e., between 60 to 65 dBA Ldn), the following mitigation measures shall be implemented.

Mitigation Measure Noise 1B - Noise Insulation: Prior to approval of building permits, a qualified acoustical consultant shall review final designs for floor plans and exterior elevations for construction of all residential buildings within the Project site. The design level acoustical report shall provide specific noise control treatment to achieve interior noise levels of 45 dBA or lower. The acoustical consultant shall identify and include on the plans and specifications for the

Project, those specific noise insulation treatments (i.e., sound rated windows and doors, sound-rated wall construction, acoustical caulking, protected ventilation openings, stucco siding, thicker walls, bedroom orientation, etc.) that are to be applied.

Mitigation Measure Noise 1C - Outdoor Noise Exposure: The Project's design shall not locate any outdoor use area closer than the calculated 61 dB Ldn contour (which is approximately 109 feet from the tracks), or shall provide noise attenuation for any outdoor use area proposed to be located within the 61 dB Ldn contour, such as the outdoor use areas at the most northerly and most southerly proposed building locations. Means capable of shielding these outdoor use areas to achieve a maximum Ldn of 61 dBA may include incorporating a noise barrier into the building design (e.g., a fence or wall measuring at least 6 feet high and subject to Site Plan and Architectural Review approval) and/or placing outdoor use areas only on the opposite side of the residential structure from the rail line (such that the structure screens noise from the rail).

Resulting Level of Significance

Moving the most northerly residential building by only a few feet inward from the rail lines (i.e., within the projected future 65 dB Ldn contour) would effectively avoid inconsistencies with City General Plan land use compatibility thresholds for community noise environments, and would reduce this impact to a level of less than significant, with little effect on the Project design. Similarly, adding noise attenuations measures for outdoor use areas at the most northerly and most southerly buildings would reduce the exposure of these residential outdoor use areas to levels below FTA threshold levels.

Throughout the Project site, future noise levels from freeway traffic noise and rail noise are expected to reach between 60 and 65 dBA Ldn, being within the "conditionally acceptable" levels. Standard residential building construction methods are generally capable of achieving a 15 dB reduction from outdoor noise. To achieving the 45 dB interior noise threshold at locations where future noise levels are anticipated to exceed 60 dBA Ldn, additional noise insulation treatments (per Mitigation Measure Noise-1B) would be capable of reducing the anticipated noise conditions inside buildings to a level of less than significant.

Train Vibration

Noise-2: The proposed Project would expose new residents to reasonably foreseeable vibration levels in excess of 72 VdB re 1 μ-inch/second, the threshold established by the FTA and FRA for residential uses. (**Less than Significant with Mitigation**)

The FTA and FRA have established ground-borne vibration impact limits that are based on research involving human subjective reaction to ground-borne vibration as produced by passenger train operations. The FTA splits vibration-sensitive land uses into three primary categories in order of sensitivity, and residential uses are identified as "Category 2" land uses. For Category 2 land use, ground-borne vibration impact criteria for frequent train events are a vibration level of 72 VdB re 1 μ-inch/second, and a vibration velocity of 0.0040 max RMS, inches/second. The "frequent event" criterion is applicable for this Project due to the extended duration of individual freight train events not due to the total number of daily operations. This approach is recommended by the FTA/FRA, and is considered to be a conservative assessment of freight train vibrations.

As part of the Environmental Noise Assessment for the NCRA Freight Rail Project, Bollard Acoustical Consultants, Inc. completed reference freight train vibration level measurements. The maximum

measured root-mean square (RMS) train vibration levels ranged from approximately 0.0049 to 0.0080 inches/second at a distance of 50 feet from the center of the tracks. These values translate to decibel vibration velocity levels (Lv) of approximately 74 to 78 VdB (re 1 µ-inch/sec.). Assuming a vibration level of 78 VdB at 50 feet from the tracks and a reduction in vibration level of -6 VdB per doubling of distance from the tracks, the 72 VdB vibration velocity threshold for an individual freight train event at a Category 2 (residential) receiver would occur approximately 100 feet from the tracks.[14] This assessment of impact with respect to vibration produced by train operations is not a function of potential damage to building structures, but is related to the subjective reaction and requirements for vibration-sensitive receivers and uses. The NCRA EIR found no known mitigation available other than long-term maintenance and improvements to the rail system itself. The NCRA EIR concluded that there is a significant number of existing residential uses that lie within 100 feet of tracks, and that this impact would be significant and unavoidable.[15]

The Project proposes to develop new residential buildings along the westerly edge of the Project site, near the railroad tracks. The nearest proposed residential building is located in the furthest northwesterly portion of the development area, approximately 50 feet from the railroad tracks. This residential building would be impacted by long-term, ground-borne freight train vibration. All other residential buildings at the site are a minimum of 100 feet from the railroad tracks, and would not be subject to adverse vibration levels.

Mitigation Measures

To address the foreseeable freight train vibration impacts, the following mitigation measures are recommended.

Mitigation Measure Noise 2 - Avoidance/Vibration Attenuation Measures: The Project shall incorporate the following vibration avoidance or reduction strategies as part of its design and/or construction.

a) Either remove or relocate the residential building proposed at the northwesterly portion of the Project site to a different location, such that no residential unit is closer than 100 feet from the railroad tracks (i.e., outside of the vibration threshold contour); or

a) Provide structural design measures into the design of the northwesterly most residential building (and generally to any structure proposed to be located closer than 100 feet from the tracks) as necessary to reduce groundborne vibration to below threshold levels. Special building methods can be incorporated to reduce groundborne vibration being transmitted into project structures. Potential methods for reducing groundborne vibration may include, but are not limited to isolation of foundation and footings using resilient spring supports, supporting the building on elastomer pads similar to bridge bearing pads, or excavating soil between the vibration source and the project so that the vibration path is interrupted and thereby reducing the vibration levels before they enter the project's structures.

Resulting Level of Significance

Moving or relocating the northerly residential building that is proposed within the projected vibration threshold contour (within 100 feet) would effectively avoid the impact, but would affect the design and

[14] Bollard, 2008, page 22

[15] NCRA, *Freight Rail Project EIR,* 2009, page 3-8.22

potentially the density of the proposed Project. Alternatively, incorporating special building methods into buildings within 100-feet of the tracks can feasibly reduce groundborne vibration from being transmitted into the structures to a less than significant level.

Train Horn Noise

Noise-3: The proposed Project would expose new residents to existing and reasonably foreseeable noise from train horns at the existing Payran crossing, and would expose existing and new residents to additional reasonably foreseeable train horn noise from trains crossing at the Project's proposed at-grade Shasta crossing. These noise levels would be a substantial periodic increase in ambient noise levels in the Project vicinity above levels existing without the Project, and that would result in substantial speech interference. (**Significant and Unavoidable**)

As discussed under Impact Noise-1, future use of the rail tracks adjacent to the Project site is expected to increase substantially in the near future. As indicated in the NRCA Freight Rail Project EIR, freight train traffic along the segment of rail adjacent to the Project site is expected to increase to a total of 6 trains per day, and the SMART commuter/passenger train service was expected to run up to 24 trains per day along this route, and additional passenger trains are also possible to accommodate additional passenger rail service. The environmental reviews for both of these expanded rail service projects have been complete, both projects have been approved by their respective Authorities, and increased rail traffic at these levels is a reasonable and foreseeable condition along this stretch of rail adjacent to the Project site.

Under the FRA Train Horn Rule (49 CFR Part 222), locomotive engineers must begin to sound train horns at least 15 seconds, and no more than 20 seconds, in advance of all public grade crossings. Train horns must be sounded in a standardized pattern of 2 long, 1 short and 1 long blast. The pattern must be repeated or prolonged until the lead locomotive or lead cab car occupies the grade crossing. The maximum volume level for the train horn is 110 decibels, and the minimum sound level is 96 decibels.[16]

FRA field measurements have shown that warning horns are generally sounded using intermittent, short bursts between ¼- and ⅛-mile from grade crossings. This area is referred to as the "½-Zone". As the train approaches the grade crossing, the horn is generally sounded with more continuous and louder bursts. With respect to the modeling of train warning horn noise exposure, a standard reference level of 108 dB at 50 feet perpendicular to the tracks is assumed at the grade crossing. This level decreases linearly to a level of 105 dB SEL in the ½-Zone area (i.e., between 660 to 1,320 feet from the crossing) at 50 feet perpendicular to the tracks. The warning horn noise exposure is assumed to decrease at a rate of -4.5 dB per doubling of distance along the track until the "no horn" noise exposure is intersected. The distance along the tracks between the grade crossing and the intersection of the "horn" and "no horn" noise contours is referred to as the "H-Zone".[17]

According to the NCRA 2009 EIR, the at-grade rail crossings nearest to the Project site is at Payran Street, approximately 700 from the southerly boundary of the Project site. The next at-grade crossing to the south is at Lakeville/Madison, and the next crossing to the north is on the other side of US 101 at South Point Boulevard. Train warning horns at these grade crossings associated with freight trains and

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[16] US Department of Transportation, Federal Railroad Administration, *The Train Horn Rule and Quiet Zones*, accessed at http://www.fra.dot.gov/Page/P0104

[17] NCRA EIR, 2009

SMART trains would produce the highest noise exposure levels and adversely affect the largest number of noise-sensitive uses when compared to any other rail-related noise source.

In an effort to reduce the frequency of the sounding of train horns, the City has established "Quiet Zone Standards" with SMART at all existing crossing within Petaluma. Thus, the sounding of train horns is not required, but permitted at the SMART train operator's discretion for railroad or safety reasons. Still, the Quiet Zone designation does not apply to freight trains and train horns will continue to be sounded with the crossing of some SMART trains.

As shown in **Figure 13-2**, portions of the Project site, as well as much of the surrounding neighborhoods, are exposed to the "severe impact zone" (in excess of 60 dB Ldn) of noise from train warning horns at the Payran crossing. The noise from train warning horns at the Payran crossing is not attributable to the Project, but this existing noise would adversely affect new residents at the Project site.

Additionally, the Project's proposed extension of Shasta Avenue crossing would add another at-grade rail crossing not previously studied in the NCRA EIR. "Severe" train horn noise levels of greater than 60 dB Ldn associated with this new crossing would extend across the Project site and into adjacent neighborhoods on both the east and west sides of the railroad tracks. The additional, or net new area exposed to train warning horns associated with the Shasta Avenue crossing would include virtually all of the existing Oak Creek Apartments, as well as homes along Graylawn Avenue, Cordelia, Jess, and Rocca Drives east of the tracks, and homes along Shasta, Cinnabar and Sycamore Lane west of the tracks (see also Figure 13-2). This new train warning horn noise would be a direct result of the Project's proposed at-grade rail crossing, would exceed FTA, FRA and City of Petaluma noise impact criteria, and would be a significant effect of the Project.

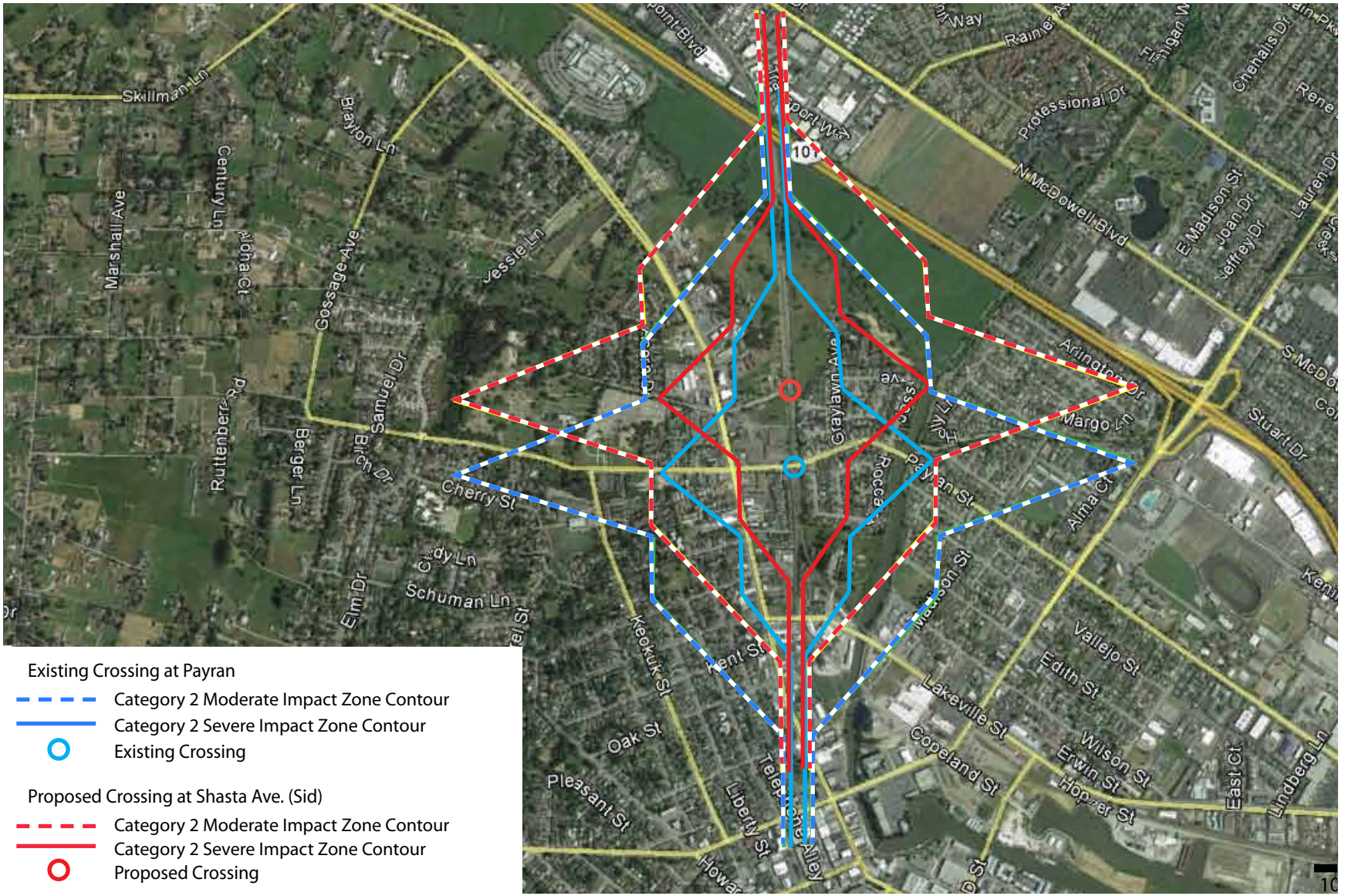

Figure 13-2
Train Warning Horn Noise Contours, at Existing and Proposed (Shasta Extension) Rail Crossings

Source: NCRA RRD Freight Rail Project Environmental Noise Assessment, Bollard Acoustical, Appendix E, Cumulative Train Noise Modeling

Mitigation Measures

The removal of warning horns cannot be considered as a possible mitigation since that would significantly increase the impact to safety at many crossings and would violate FRA safety regulations. Neither NCRA nor its operator is willing to accept the liability from decreased safety associated with the removal of warning horns. The only viable mitigation measure to address train-warning horns is as recommended below.

Mitigation Measure Noise 3 - Quiet Zone: The Project applicant shall be responsible for obtaining a "Quiet Zone" designation for the Shasta Avenue crossings. A Quiet Zone application must be a joint application between the local jurisdiction and the rail operator, and must include supplementary safety measures to ensure that safety is not compromised by eliminating the required sounding of the train horns. The Project applicant shall be financially responsible for all costs associated with obtaining the Quiet Zone designation and implementation of the supplementary safety measures, including installation of crossing controls that meet FRA requirements.

Resulting Level of Significance

The addition of new residents at the Project site would increase the number of people subject to existing "severe" noise from train warning horns at the existing Payran crossing. The Quiet Zone designation established for this existing at-grade crossing, effective May 23, 2017, significantly reduces noise from train horns, but not to a level of less than significant.

The implementation of a Quiet Zone at the Shasta Avenue crossing would significantly reduce train noise exposure and the number of impacted people. However, the FRA has final jurisdiction over Quiet Zone applications. Although quiet zone has been established for existing at-grade crossing, effective May 23, 2017, neither the Project applicant, nor the City of Petaluma can ensure that a Quiet Zone could be established at this crossing. The feasibility and timing of establishment of the Quiet Zone cannot be determined.

Additionally, although the application of a Quiet Zone would help to reduce the frequency of people affected by warning horns at the Shasta Avenue crossing, this measure would not mitigate noise exposure to a less than significant level. Even with establishment of a Quiet Zone, noise from sounded horns could be as loud as 110 dBA, and would adversely affect homes (both new Project residences and existing residences) near the Shasta Avenue grade crossing approach. Quiet zones do not preclude the use of train horns at railroad crossings, but rather allows the train operator to use discretion in sounding horns when there is an apparent safety issue.

No other mitigation measures that would reduce the impact to a less than significant level are known at this time. Therefore, this train horn impact to new residents at the Project site from the existing Payran crossing and to existing and new residents from the Project's proposed at-grade Shasta crossing is considered significant and unavoidable.

Construction Noise Impacts

Noise-4: Construction of the proposed Project would result in temporary or periodically significant noise impacts, especially where grading and construction activities are to be conducted in close proximity to existing and new sensitive receptors, specifically including the existing Oak Creek Apartments and neighbors along Bernice Court, Graylawn Avenue and Jesse Avenue. (**Significant and Unavoidable).**

Construction Noise Levels

Construction of the Project is expected to occur in stages, where site preparation, grubbing and grading is followed by construction of building foundations and erection of buildings. The project also involves improvements to circulation and access including along Grawlawn Avenue, Shasta Avenue and the EVA at Bernice Court. Additionally, the terracing component of the project will involve construction activities (vegetation and soil removal, excavation, and restoration and replanting) along the site frontage to the Petaluma River including a portion adjacent to the existing Oak Creek Apartments.

Construction activities will affect existing residents in close proximity to the work area including the existing Oak Creek Apartments and neighbors along Bernice Court, Graylawn Avenue and Jesse Avenue.

Construction of the Project is expected to occur over a period of approximately 20 months, including:

- An approximately 2 to 3-month period during which the Project site will be graded using heavy duty construction equipment (graders, dozers, tractors, backhoes, etc.);
- An approximately 15-month period will provide for construction of apartment buildings, with construction access via Graylawn Avenue. A portion of Shasta Avenue (not including the rail crossing) will be constructed, as will the Bernice Court EVA. Water, sanitary sewer and storm drain lines will be connected to existing mains within Graylawn and/or extended through the Phase I site. These activities will involve use of construction equipment including trenchers, loaders, generators and forklifts, and well as construction crews using saws, hammers and other pneumatic tools.
- The final 2 to 3-month period includes painting, and roadway and parking lot paving. These activities will involve use of construction equipment including pavers, rollers and air compressors.

During Project construction, temporary noise increases would result from the operation of heavy equipment. Construction noise levels would fluctuate depending on the construction phase, equipment type and duration of use, distance between noise source and receptor, and presence or absence of barriers between noise sources and receptors. To estimate probable noise impacts, typical equipment and construction techniques are assumed.

Construction noise sources range from about 76 to 85 dBA at 50 feet for most types of construction equipment, with higher levels of about 88 to 89 dBA at 50 feet for certain types of earthmoving (scrapers and pavers) and impact equipment (jack hammers and pile drivers). Typical noise levels at 50 feet from the noise source for several types of construction equipment that may be used for this Project and potential noise attenuation with feasible noise controls (i.e., equipment mufflers) at the noise source are shown in **Table 13-9**.

Table 13-9: Typical Construction Equipment Noise Levels (at 50 feet)

Equipment	Noise Level (dBA) @ 50 Feet	@ 50' With Feasible Noise Controls[1]
Earthmoving:		
Front Loader	79	75
Backhoe	85	75
Dozer	80	75
Tractor	80	75
Scraper	88	80
Grader	85	75
Paver	89	80
Materials Handling:		
Concrete Mixer	85	75
Concrete Pump	82	75
Crane	83	75
Stationary:		
Pump	76	75
Generator	78	75
Compressors	81	75
Impact:		
Jack Hammer	88	75
Pneumatic Tools	86	80
Other:		
Saw	78	75
Vibrator	76	75

1: Estimated levels obtainable by selecting quieter procedures or machines and implementing noise -control features requiring no major redesign or extreme cost

Source: U.S. Environmental Protection Agency, Noise from Construction Equipment and Operations, Building Equipment, and Home Appliances, 1971.

During construction operations it is likely that more than one piece of construction equipment will be operating at the same time. Data pertaining to typical outdoor noise levels for each construction period sub-phase is presented in **Table 13-10**. This table shown noise levels that represent composite construction noise associated with typical construction activities, and which take into account both the number and spacing of heavy construction equipment that are typically used during each phase of construction. As shown, construction noise can reach a maximum of 86 dBA Leq when measured at a reference distance of 50 feet from the construction activities. Noise levels such as these would be generated at the Project site during each stage of construction. These noise levels would diminish rapidly with distance from the construction sites at a rate of approximately 6 dBA to 7.5 dBA per doubling of distance.

Table 13-10: Typical Outdoor Construction Noise Levels

Construction Phase	Noise Levels at 50 Feet (dBA Leq)	Noise Levels at 50 Feet with Mufflers (dBA Leq)
Ground Clearing	84	82
Excavation, Grading	89	86
Foundations	78	77
Structural	85	83
Finishing	89	86

Source: United States Environmental Protection Agency, Noise from Construction Equipment and Operations, Building Equipment and Home Appliances, PB 206717, 1971

This analysis uses criteria of the Federal Transit Administration's (FTA) of construction noise impacts to residential land uses, to determine if a significant impact would occur. According to these FTA criteria, an adverse construction-period noise impact would occur if construction noise exceeds 90 dBA Leq during a one-hour period, or if it exceeds 80 dBA LEQ over an 8-hour period during daytime hours. Based on noise levels of various construction phases and sub-phases, peak noise generated by construction equipment could significantly affect existing adjacent or nearby development:

- The closest existing sensitive receptors include several residences along Graylawn Avenue and Bernice Court, which back onto the Project site and are only a few feet from the edge of the property line, and about 30 feet from the proposed alignment of the Shasta Avenue extension. Similarly, existing residences are located at either corner of the Graylawn Avenue/Jesse Avenue intersection, and are only 30 to 50 feet from the proposed access off Graylawn Avenue. Grading and construction of the Shasta Avenue extension on the Project site , improvements to existing stretches of Graylawn Avenue and Shasta Avenue (west of the rail line), as well as construction of the EVA to Bernice Court and of site access generally, could generate construction-related noise levels of between 86 and 92 dBA at these homes. Those residences located closer than 100 feet from construction activities associated with the Project would be subject to noise levels above 75 dBA, where speech interference effects could occur.

- Additionally, the Oak Creek Apartments are located as close as 30 feet from the proposed access from Graylawn Avenue (on the west side of Graylawn Avenue), 85 feet from the nearest proposed new residential building within the Project, and as close as 50 feet from the proposed terracing and river trail construction. At 30 feet, maximum construction-related noise levels associated with road construction (when a paver is operated within 30 feet of existing apartments) could reach 92 dBA (Leq). Those apartment units located closer than 100 feet from construction activities associated with the Project would be subject to noise levels above 75 dBA, where speech interference effects could occur.
- All other existing residential development east and south of the Project site would be located more than 100 feet from the construction area for proposed new residences and roads. At 100 feet, construction activities (assuming use of feasible noise controls on the source equipment) would generate noise levels of approximately 69 to 74 dBA, which would be at or below the maximum exterior noise level at which an acceptable interior noise environment for normal conversation can be maintained. Exceptions may occur during temporary and intermittent operation of noisier construction equipment (e.g., scraper, paver and pneumatic tools).
- New sensitive receptors (new residences onsite while construction is still ongoing), would be exposed to similar elevated noise levels associated with construction activities. Those new on-site residents located immediately adjacent to ongoing construction could be subjected to maximum construction-related noise levels (where excavation and paving is conducted within 30 feet of these new apartments) that may reach 93 dBA (Leq).

The increase in noise levels at nearby locations during construction would be temporary in nature and would not generate continuously high noise levels, although occasional single-event disturbances from construction are possible. The majority of construction activities would take place at a distance farther than 50 feet from existing residences to the south. In the later phases of construction (i.e., during interior building construction) noise levels are typically reduced due to the newly erected physical structures that interrupt noise transmission. Thus, the highest noise levels that would be experienced by adjacent sensitive receptors would only occur for a limited duration during construction activity. However, the temporary or period impact when grading or construction activities occur within 100 feet of an existing residence would be significant.

Mitigation Measures

To address construction-period noise impacts, the following mitigation measures shall be implemented.

Mitigation Measure Noise 4A - Construction Hours: Due to the proximity of sensitive receptors (residences) to the development areas, construction activities shall be required to comply with following, and shall be noted accordingly on construction contracts:

a) Construction activities for all phases of construction, including servicing of construction equipment shall only be permitted during the hours of 7:30 a.m. and 6:00 p.m. Monday through Friday, and between 9:00 a.m. to 5:00 p.m. on Saturdays.

b) Construction is prohibited on Sundays and on all holidays recognized by the City of Petaluma.

c) Delivery of materials or equipment to the site and truck traffic coming to and from the site is restricted to the same construction hours specified above.

Mitigation Measure Noise 4B - Construction Engine Controls: The Project Applicant shall implement the following engine controls to minimize disturbance to adjacent residential uses during Project construction:

a) Construction equipment shall utilize the best available noise control techniques (including mufflers, intake silencers, ducts, engine enclosures and acoustically attenuating shields or shrouds) in order to minimize construction noise impacts. These controls shall be used as necessary to reduce heavy equipment noise to 75 to 80 dBA (Leq) at 50 feet to minimize noise levels at the closest residential receptors.

b) If impact equipment such as jackhammers, pavement breakers, and rock drills is used during construction, hydraulically or electric-powered equipment shall be used to avoid the noise associated with compressed-air exhaust from pneumatically powered tools.

c) Where use of pneumatically powered tools is unavoidable, an exhaust muffler on the compressed-air exhaust shall be used. External jackets on the tools themselves shall also be used, where feasible.

Mitigation Measure Noise 4C - Stationary Equipment and Staging: Locate stationary noise generating equipment that generates noise levels in excess of 65 dBA Leq as far as possible from sensitive receptors.

a) If required to minimize potential noise conflicts, the equipment shall be shielded from noise sensitive receptors by using temporary walls, sound curtains, or other similar devices.

b) The construction contractor shall not stage equipment within 200 feet of the existing residential land uses to the west and south of the project site.

c) Heavy equipment, such as paving and grading equipment, shall be stored on-site whenever possible to minimize the need for extra heavy truck trips on local streets.

Mitigation Measure Noise 4D - Miscellaneous Construction Noise: The contractor shall minimize use of vehicle backup alarms and other miscellaneous construction noise.

a) A common approach to minimizing the use of backup alarms is to design the construction site with a circular flow pattern that minimizes backing up of trucks and other heavy equipment.

b) Another approach to reducing the intrusion of backup alarms is to require all equipment on the site to be equipped with ambient sensitive alarms. With this type of alarm, the alarm sound is automatically adjusted based on the ambient noise.

c) Construction worker's radios shall be controlled to be inaudible beyond the limits of the project site boundaries.

Mitigation Measure Noise 4E - Noise Barriers: The construction contractor shall erect temporary walls, sound curtains or other similar devices along the property lines adjacent to the existing Oak Creek Apartments and neighbors along Bernice Court, Graylawn Avenue to shield these existing sensitive receptors from construction noise.

Mitigation Measure Noise 4F - Noise Disturbance Coordinator: The Project applicant / construction contractor shall designate a city-approved Noise Disturbance Coordinator, designated to respond to any local complaints about construction noise. The disturbance coordinator will

determine the cause of the noise complaint (e.g., starting too early, bad muffler, etc.) and will require that reasonable measures warranted to correct the problem be implemented. The construction schedule and telephone number for the Noise Disturbance Coordinator shall be conspicuously posted at the Project construction site.

Resulting Level of Significance

With required conformance with the City of Petaluma Noise Ordinance and implementation of recommended mitigation measures, the majority of construction-period noise impacts would be reduced to a level of less than significant. However, because of the intensity, that the duration of construction activity will occur for a period of more than 1 year, and certain construction activities resulting in noise levels exceeding 90 dBA Leq are expected to occur as near as 30 feet from the nearest existing sensitive receptor and may not be able to be effectively attenuated to acceptable (i.e., 80 dBA) levels at these nearby residences with use of available noise reduction strategies, construction noise effects on nearby neighbors is conservatively considered to be significant and unavoidable.

Project Operational Noise

Noise-5: Project Operational Noise Generation due to the use and occupation of the project residences on adjacent noise sensitive uses is not expected to significantly increase or alter the existing noise environment at these uses. (**Less than Significant**)

The Project would place new residential uses immediately adjacent to existing residential uses that are located along Bernice Court, Graylawn Avenue, and at the existing Oak Creek Apartments. The occupation and use of the proposed residences is expected to result in the typical noises associated with residential development, including voices of the new residents, home maintenance activities, barking dogs and children. Though the noise environment may change noticeably in some areas due to the occupation of the new residences, the noise associated with the proposed residences is compatible with the surrounding land uses, is anticipated by the City's General Plan, and therefore is not judged to result in a noise impact.

Mitigation Measures

None needed.

Traffic Noise Impacts

Impact Noise-6: Traffic generated by the Project would not result in a substantial, permanent significant increase in ambient noise levels in the vicinity. Traffic generated by the Project would not result in a permanent increase in ambient noise levels of 4 dBA or more, such that traffic noise would exceed "normally acceptable" noise levels at nearby land uses. (**Less than Significant**)

Based on noise calculations prepared in 2008,[18] and augmented with noise measurements from the 2012 Rainier EIR, the current traffic load on Graylawn Avenue (which is measured at 954 ADT based on

[18] Although noise measurements were taken approximately 8 years ago, no substantial change in new noise sources have occurred in this area. To the extent that freeway traffic noise, train noise or other ambient noise

the traffic analysis presented in Chapter 14 of this DEIR) generates an average CNEL of 52.8 dBA at 50 feet from the roadway centerline (see prior Table 13-4). To cause a 4-dBA increase in traffic noise along this roadway, the Project would have to generate enough traffic to more than double current roadway volumes. Based on the Traffic analysis presented in this Draft EIR, the Project would generate an additional 676 new daily trips on this road, or an approximately 70% increase in traffic levels.[19] Therefore, traffic volumes on Graylawn Avenue would not double, and the resulting traffic noise increase would be less than 4 dBA. This change in traffic noise would be less than significant.

The Project's contribution to existing traffic levels along all other nearby roadways (i.e., North Petaluma Boulevard, Shasta Avenue, Sycamore Avenue, West Payran Street, and East Washington Street) would be proportionally less than its contribution to Graylawn Avenue, and therefore the traffic noise increase attributable to the Project on these other roadways would be substantially less than a 4 dBA increase, and the impacts related to traffic noise increase on these other roadways would be less than significant.

The Project does propose a new roadway, the Shasta Avenue Extension to Graylawn. The centerline of this new roadway would be located approximately 60 to 70 feet from the rear property line of residences located along Bernice Court and Graylawn Avenue. Several existing homes are constructed at or near this property line, and would be exposed to this new noise source. Noise levels generated along this new roadway can be approximated based on projected traffic volumes, as compared to traffic volumes and resulting noise levels along Graylawn.

- As indicated above, the existing 954 ADT on Graylawn generates a CNEL of approximately 52.8 dBA,
- The Shasta Avenue Extension to Graylawn is projected to carry approximately 1,132 ADT, or approximately 1.2 times as many vehicles as does Graylawn under existing conditions.
- Because of its higher traffic volumes, it can be estimated that the Shasta Avenue Extension would generate slightly more noise than does the existing traffic on Graylawn, but not as much as a 4 dBA increase over 52.8 dBA (to result in a 4 dBA increase in traffic noise, traffic volumes would need to more than double the 954 ADT volumes on Graylawn).

Conservatively assuming that the Shasta Avenue Extension to Graylawn may generate as much as 54 to 55 dBA CNEL at 50 feet from its centerline, this new noise source would not generate noise levels greater than 60 dBA, and its noise impacts would be less than significant.

Traffic noise generated by the Project would be less than significant.

Mitigation Measures

None needed.

conditions have increased since 2008, the Project's net new contribution to these ambient noise levels would represent a smaller contribution to the increase over existing noise levels, and thus the analysis presented here is considered conservative.

[19] See also the Alternatives chapter of this EIR for a discussion of alternative access plans for the Project that do not rely on the Shasta Avenue extension across the rail tracks, and the implications for increased traffic and traffic noise on Graylawn.

Cumulative Traffic Noise Impacts

Impact Noise-7: Traffic generated by the Project, combined with other cumulative traffic noise in the vicinity would not result in a substantial permanent and significant increase to ambient noise levels. Cumulative traffic, plus traffic generated by the Project, would not result in a permanent increase in ambient noise levels of 4 dBA or more, and would not exceed "normally acceptable" noise levels at nearby land uses. (**Less than Cumulatively Significant**)

Projections of future cumulative traffic noise have been derived from two primary sources, the Petaluma General Plan EIR and the Rainier Cross-Town Connector EIR.

City-wide Arterial Roadway Noise

The Petaluma General Plan EIR analyzed noise level increases resulting from General Plan buildout, at sensitive receptors along selected roadways (as presented in Table 3.9-6 of the General Plan EIR). The General Plan EIR found that traffic associated with buildout of the General Plan would increase local noise levels by more than one decibel in most of the studied roadway segments, but would not result in an increase in traffic noise by 4 or more dBA (i.e., a significant increase) along any roadways except the roadway segment of Ely Road north of Frates Road and the roadway segment of Frates Road east of Ely Road. The Project does not contribute measurable levels of traffic to either of these two roadways, and Cumulative plus Project traffic noise impacts are therefore less than significant.

Rainier Connector

The Rainier Avenue Cross-Town Connector Project is a proposed new 0.65-mile long, 4-lane arterial roadway connecting North McDowell Avenue on the eastern side of Highway 101 to Petaluma Boulevard North on the western side of the City. The Rainier Avenue extension would extend at grade from the signalized North McDowell Avenue intersection, cross under Highway 101 beneath an elevated portion of the freeway that will be constructed as part of the Marin-Sonoma Narrows HOV project, and would cross over the Petaluma River and SMART Corridor via an elevated bridge. The proposed bridge crossing would be located immediately north of the Project site. After crossing the Petaluma River and tracks, the Rainier Connector would continue at grade to Petaluma Boulevard North, where it would terminate at a signalized T-intersection.

As indicated in Table 4.9-12 of the Rainier Draft EIR, noise level increases resulting from the Rainier Cross-Town Connector would be 3 dBA CNEL or less at existing sensitive receptor locations along the corridor, including two identified locations within the Project site (just north of the existing landscaped Graylawn Avenue turn-around and abutting the rail tracks in the northerly portion of the Project site, see Figure 13-1). At the two on-site receptor locations studied in the Rainier EIR, no measurable traffic noise impacts were identified. As part of General Plan buildout plus the Rainier Cross-Town Connector, a new roadway is planned (known as the Shasta Avenue Extension to Rainier, which is distinct from the Project's proposed Shasta Extension to Graylawn). At this location, future cumulative traffic noise levels are projected to increase from approximately 60 dBA CNEL to 63 dBA CNEL, but would not increase ambient noise levels by 4 dBA or more, and would not exceed "normally acceptable" noise levels of 65 dBA at nearby land uses. Additionally, the Rainier Cross-Town Connector would connect at a new intersection at North Petaluma Boulevard (location ST2 in the Rainier EIR, see Figure 13-1). Expected noise levels at this future intersection are projected to increase with increased traffic from cumulative plus Project traffic, from 69 dBA CNEL to 70 dBA CNEL. Traffic noise at this location already exceeds the 65-dBA "normally acceptable" noise level, but the increase of 1 dBA would not represent an increase in ambient noise levels by 4 dBA or more and the cumulative effect is less than significant.

Graylawn Traffic Noise

An additional consideration for cumulative traffic noise is whether vehicles other than Project-related traffic may use Graylawn Avenue to travel through the Project as a short cut between Payran Street and Petaluma Boulevard, via the Shasta Avenue at-grade crossing and extension through the Project site. As discussed in Chapter 14: Traffic relative to Impact Transp-8, this potential detour route would be circuitous and unlikely to induce significant traffic demand, as compared to the more direct route on Payran Street. Therefore, the Project would not induce substantial cut-through vehicles to use Graylawn Avenue, and cumulative traffic noise is not expected to increase beyond that indicated under Existing plus Project conditions.[20]

Petaluma Trolley

In addition to railroad service, the Petaluma Trolley proposes to develop Heritage Trolley Service along the old Petaluma and Santa Rosa electric railroad rights–of–way from downtown Petaluma to Corona Road. The preliminary schematic (April 2000) indicates that the tracks would extend along the western Project boundary (adjacent to the NWP tracks). Trolley operations are planned to involve provision of weekend and holiday service using the original 1904 electric trolley. It is anticipated that electric trolley operations would generate noise levels well below those generated by freight and commuter use of the railroad, but would contribute to future cumulative noise increases along the railroad right-of-way adjacent to the Project site. The potential for the Petaluma Trolley operations to affect noise levels onsite is considered less than significant.

Mitigation Measures

None needed. The Project's contribution to cumulative traffic noise in the area is considered less than significant.

[20] See also the Alternatives chapter of this EIR for a discussion of alternative access plans for the Project that do not rely on the Shasta Avenue extension across the rail tracks, and the implications for increased traffic and traffic noise on Graylawn.