

4.6 HYDROLOGY & WATER QUALITY

4.6.1 ENVIRONMENTAL SETTING

IN THIS SECTION:

- Regulatory Setting
- Hydrological Setting
- Groundwater
- Stormwater Drainage
- Flood Hazards
- Water Quality

The section draws from analyses contained in the City of Petaluma *General Plan 2025* Environmental Impact Report (EIR) that was certified on May 19, 2008 and other studies cited in this section. The City's General Plan and EIR are available on the City's website at: <http://cityofpetaluma.net/cdd/plan-general-plan.html> and available for review at the City of Petaluma Community Development Department, Planning Division office located at 11 English Street in Petaluma, on Monday through Thursday between the hours of 8 AM to 12 PM and 1 PM to 5 PM.

REGULATORY SETTING

Federal Regulations

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.

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 flood zone.

State Regulations

The California State Water Resources Control Board (State Board) 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 the 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 State Board 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 include 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.

The 1987 amendments to the Clean Water Act (Section 402[p]) provided for the U.S. EPA regulation of several new categories of non-point pollution sources within the existing NPDES. The EPA has delegated management of California's NPDES stormwater permit program to the State Board and the nine RWQCB offices. In Phase 1, NPDES permits were issued for urban runoff discharges from municipalities of over 100,000 people, from plants in industries recognized by the EPA as being likely sources of stormwater pollutants, and from construction activities that disturbed more than five acres. Phase 2 implementation, effective July 1, 2013, extended NPDES urban runoff discharge permitting to cities with populations between 50,000 to 100,000, and to construction sites that disturb between 1 and 5 acres. The State Board has developed several general permits for coverage under the Phase 2 NPDES stormwater permit program.

Construction activity on projects that disturb one or more acres of soil, or less than 1 acre but are part of a larger common plan of development that in total disturbs one or more acres, must obtain coverage under the General Permit for Discharges of Storm Water Associated with Construction Activity (Construction General Permit, 2009-0009-DWQ). Construction activity

subject to this permit includes clearing, grading, and disturbances to the ground such as stockpiling or excavation, but does not include regular maintenance activities performed to restore the original line, grade, or capacity of a facility. The Construction General Permit requires the development and implementation of a Storm Water Pollution Prevention Program (SWPPP). The SWPPP shall identify stormwater collection and discharge points, drainage patterns across the project, and best management practices (BMPs¹) that the discharger will use to protect stormwater runoff and the placement of those BMPs.

As mandated by Section 303(d) of the Federal Clean Water Act, the State Board maintains and updates a list of “impaired water bodies” (i.e., water bodies that do not meet State and Federal water quality standards). This list is known as the Section 303(d) list of impaired waters. The State is then required to prioritize waters/watersheds for development of Total Maximum Daily Load (TMDL) regulations. This information is compiled in a list and submitted to the EPA for review and approval. The State Board and Regional Boards monitor and assess water quality on an ongoing basis.

Local Regulations

As indicated above, the federal Clean Water Act regulates discharge from storm drain systems in order to reduce surface water pollutants and improve water quality. The Phase II Stormwater Program, adopted by the U.S. EPA and administered by the San Francisco Bay Regional Water Quality Control Board, requires operators of small municipal separate storm sewer systems to obtain a NPDES permit and implement programs and activities to reduce pollutants in storm water runoff. The City of Petaluma, as an operator of a municipal storm drain system prepared a Storm Water Management Plan and began implementation of this Plan in March 2003, in order to comply with the Phase II program requirements. The Plan acts as the City’s permit, describing actions that include best management practices, measurable goals, and timetables for implementation (City of Petaluma, September 2006).

In July 2013, the City of Petaluma applied for the updated Storm Water Discharges from Small Municipal Separate Permit General Permit Number CAS000004 as required by the California State Water Resources Control Board. The City has five years from the date of application to develop and implement the program requirements within the new permit. The new requirements relate to post-construction storm water quality best management practices under section E12 of the new permit, are in the initial development stages and are not expected to become final until July 2015. Therefore, the Riverfront project is required to comply with existing Phase II permit requirements.

¹ BMPs are either pollution prevention practices or structural controls designed to reduce or eliminate pollutant discharges. BMPs typically emphasize “good housekeeping methods,” chemical handling procedures, spill prevention, and proper waste storage and disposal.

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.

In September 1982, the Petaluma City Council established the Storm Drainage Impact Fee as a means of mitigating storm drainage impacts occurring as a result of development. The criteria provides 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.

HYDROLOGICAL SETTING

The project site is located adjacent to the Petaluma River. The Petaluma River watershed covers approximately 146 acres in southern Sonoma and northern Marin Counties. The lower 12 miles of the Petaluma River flow through the Petaluma Marsh. The river ultimately empties into the northwest portion of San Pablo Bay; the City of Petaluma is located approximately 12 miles north of San Pablo Bay. Tidal influence extends approximately 14 miles upstream of San Pablo Bay, to near the confluence of Lynch Creek above downtown Petaluma (City of Petaluma, September 2006). Within the *Central Petaluma Specific Plan* area in which the project site is located, the Petaluma River is restricted to a well-defined and confined channel with an average 200-foot width, and urban development extends to the river's edge over most of its length. The depth of the channel from the top of the bank to the channel bottom ranges from 18 to 20 feet (City of Petaluma, March 2003).

GROUNDWATER

The City of Petaluma is located in the Petaluma Valley groundwater basin, which covers 46,000 acres (City of Petaluma, September 2006). The City of Petaluma uses groundwater for drinking water supply as an emergency supply and for meeting peak demands, as needed.

The project site is not located within an area of either confirmed or potential groundwater recharge, as shown on the City's map of Groundwater Resources.² The project site is located in an area identified as a slow recharge area. The project site is expected to make a minimal contribution to recharge of the area's groundwater reserves, and future development would not interfere substantially with groundwater recharge such that there would be a net deficit in aquifer volume or a lowering of the local groundwater table level. Therefore, the subject project would have no impacts to groundwater recharge or availability.

² West Yost & Associates. February 26, 2004. "Technical Memorandum No. 4, Groundwater Feasibility Study," Figure 11. City of Petaluma General Plan 2025 Draft EIR Appendix F.

STORMWATER DRAINAGE

The site and adjacent properties currently drain into the Petaluma River via existing drainage facilities described below. According to the Central Petaluma Specific Plan EIR, a 21-inch and a 24-inch culvert connects to a 42-inch culvert in Hopper Street that drains the Highway 116/Highway 101 interchange and conveys flows to earthen ditches leading through the adjacent former Pomeroy site to the west of the project site and into the Petaluma River. A drainage channel enters the project site from the west approximately 400 feet from the northwestern corner of the site. The drainage channel runs in a north-south direction and discharges to the Petaluma River. The project plans (Sheet TM-11) show two existing storm drains that discharge into the Petaluma River.

FLOOD HAZARDS

The project site is not located within an inundation area associated with a levee or dam. The project site is not located within an area that could be affected by seiche, tsunami, or mudflow. Seiche and tsunamis are short duration earthquake-generated water waves in enclosed bodies of water and the open ocean, respectively. The project geotechnical investigation indicated that the site is located 12 miles north of San Pablo Bay. Additionally, the site is at an elevation of at least 15+ feet and located sufficiently inland so that the potential for a seiche or tsunami to damage the development area is considered to be low (Miller Pacific Engineering, March 2006).

Petaluma River Flooding

The project site is located adjacent to, but outside of the 100-year floodplain, as shown in the City's General Plan (Figure 8-1) and General Plan EIR (Figure 3.6-4). The Federal Emergency Management Agency (FEMA) and City of Petaluma are updating the City's Flood Insurance Rate Maps. FEMA accepted the City's model and technical data and in April 2012 released draft FIRM panels. The map was recently revised in June 2013. FEMA has issued the City updated flood insurance rate maps. The maps become effective on February 19, 2014.

The project site is located in Panel 1001 of the February 19, 2014 Flood Rate Insurance Map. The Riverfront site is not located in either the 100-year or 500-year floodplain, although the drainage ditch to the east of the site, between the project site and the Caltrans right-of-way is within the 100-year floodplain. The 100-year flood surface elevation in the Petaluma River and the ditch between Highway 101 and the Riverfront site is 9.0 feet (NAVD 1988 Datum) on the February 2014 FIRM map.

The Federal Emergency Management Agency (FEMA) has completed the draft San Francisco Bay Area Coastal Study. The project remaps the flood hazards along coastal areas within the San Francisco Bay. The northern most limits of the study include the southern portions of the City of Petaluma. The draft maps indicate that the 100-year flood surface elevation in the southern portion of Petaluma, including the Petaluma River fronting the Riverfront project site, increase from 9.0 feet (NAVD) to 10.0 feet (NAVD). The draft maps were issued to local jurisdictions, including the City of Petaluma, for review on December 3, 2013.

The City has reviewed the draft maps, termed work maps, and has preliminarily determined that the Bay Coastal Study is nearly identical to the current floodplain maps at the Riverfront project site. As shown on the draft work maps, the Riverfront site is outside of the floodplain and not impacted by revised flood surface elevations. The work maps are in draft version and are scheduled to be released for public review in May 2014.

Sea Level Rise

Sea level rise provides a physical measure of possible oceanic response to climate change. Average global sea level has risen between five to nine inches during the 20th century as reported by the International Panel on Climate Change (IPCC), nearly one-tenth of an inch each year (California Environmental Protection Agency, August 2013). The rise in global sea level is attributed to the thermal expansion of ocean water and the melting of mountain glaciers and ice sheets around the globe. At the current rate of rise, the seas could rise another half foot over the next 50 years (Ibid.). Although sea level rise is not a new phenomenon, having been a major natural component of coastal change throughout time, the current concern is that with increased global warming and melting of ice sheets on Greenland and West Antarctica, the rate of change may increase (Ibid.).

Along California's coast, sea level already has risen by an average of seven inches over the last century – three inches at Los Angeles, eight inches at San Francisco, and an estimated six inches at La Jolla near San Diego (California Environmental Protection Agency, August 2013). Sea level rise and storm surges could lead to flooding of low-lying areas, loss of coastal wetlands such as portions of the San Francisco Bay Delta system, erosion of cliffs and beaches, saltwater contamination of some groundwater aquifers and drinking water, and impacts on roads, causeways, storm drains, sewage treatment plants and bridges (Ibid.).

Current sea-level rise projections range widely with estimates of 0.57 to 1.9 meters (approximately 2-6 feet) increase in mean sea level by 2100 (U.S. Department of the Interior, 2013). In view of the huge variation in projections of future sea level later this century, the California Department of Water Resources, along with other State agency partners, asked the National Research Council (NRC) to address planning for future sea level rise, including estimation of a range of likely amounts of sea level rise in 2030, 2050, and 2100. Three federal agencies and the states of Oregon and Washington also joined the study. The committee

convened by the NRC recently released a report presenting regional projections for California, Oregon, and Washington that show a distinction at Cape Mendocino in northern California. South of that point, sea level rise is expected to be very close to global projections (relative to 2000); projections are 4 to 30 centimeters (cm) (1.6 to 11.8 inches (in) by 2030, 12 to 61 cm (4.7 to 24 in) by 2050, and 42 to 167 cm (16.5 to 65.7 in) by 2100) (California Environmental Protection Agency, August 2013). However, projections are lower north of Cape Mendocino (-4 to +23 cm by 2030 (-1.6 to 9.1 in), -3 to +48 cm (-1.2 to 18.9 in) by 2050, and 10 to 143 cm (3.9 to 56.3 in) by 2100, relative to 2000), where land is rising largely due to plate tectonics (Ibid.).

The International Panel on Climate Change has identified coastal ecosystems as areas that will be disproportionately affected by climate change. The expected accelerated rate of sea-level rise through the 21st century will put many coastal ecosystems at risk, especially those in topographically low-gradient areas (U.S. Department of the Interior, 2013). The U.S. Geological Survey (USGS) recently assessed marsh accretion and plant community state changes through the year 2100 at 12 tidal salt marshes around San Francisco Bay estuary with a sea-level rise response model, including the Petaluma River Marsh, located approximately 6 miles downriver of the project site. The USGS study reports that the results from the modeling showed that 96% of the study area (nine sites) would become mudflats by 2100 with a 1.24 meter sea-level rise by the year 2100. The study has raised concerns for the State Lands Commission (SLC) regarding sea level rise issues associated with any SLC leases, including the proposed Riverfront Park adjacent to the project site.

WATER QUALITY

The California Environmental Protection Agency and the San Francisco Bay RWQCB list existing beneficial uses for the Petaluma River in the Water Quality Control Plan (Basin Plan³). These beneficial uses include: cold freshwater habitat, estuarine habitat, preservation of rare and endangered species, water contact recreation, non-contact water recreation, fish migration, fish spawning, warm freshwater habitat, wildlife habitat, and navigation.

The Petaluma River is listed on the 2002 Clean Water Act's section 303(d) list as being impaired for nutrients, pathogens, sediment, diazinon, and nickel. Section 303(d) of the federal Clean Water Act requires that states identify water bodies that do not meet water quality standards. Total Maximum Daily Loads (TMDLs) are then developed for each water body on the list that include identifying sources of pollutants, defining how much of a pollutant a water body can tolerate while still meeting water quality standards, and specifying actions that create solutions. TMDLs for nutrients and pathogens will be developed as part of ongoing

³ San Francisco Bay Basin (Region 2) "Water Quality Control Plan (Basin Plan)" – Incorporating all amendments approved by the Office of Administrative Law as of December 31, 2011.

watershed management effort, and additional monitoring and assessment conducted as needed.⁴

4.6.2 IMPACTS AND MITIGATION MEASURES

CRITERIA FOR DETERMINING SIGNIFICANCE ANALYSIS

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, a project impact would be considered significant if the project would:

- 6a Substantially deplete groundwater supplies or interfere substantially with groundwater recharge;
- 6b 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;
- 6c 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;
- 6d Violate any water quality standards or waste discharge requirements or otherwise substantially degrade surface water quality;
- 6e 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;
- 6f Locate structures within a 100-year flood hazard area that would impede or redirect flood flows;
- 6g 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;
- 6h Expose people or structures to a significant risk of loss, injury or death as a result in inundation by seiche, tsunami, or mudflow.

IMPACT ANALYSIS

Based on the significance criteria identified above and on the analyses in the Revised Initial Study (Appendix A of this DEIR), the project would not substantially deplete groundwater or interfere with groundwater recharge (6a), alter the course of a stream or river that could lead to erosion (6b), or expose people or structures to flooding due to a levee or dam failure (6g) or

⁴ California Regional Water Quality Control Board. "2010 Integrated Report (Clean Water Act Section 303(d) List/305(b) Report) – Statewide." Online at: http://www.waterboards.ca.gov/water_issues/programs/tmdl/integrated2010.shtml.

due to inundation by a seiche or tsunami (6h). The following impact analyses address potential drainage impacts (6c), water quality impacts (6d) and potential exposure to flood hazards, including sea level rise (6e-f).

Stormwater Runoff & Drainage

Impact 4.6-1 – Stormwater Drainage: Buildout of the project site would result in a significant increase in stormwater runoff that would ultimately discharge into the Petaluma River, and which would result in *potentially significant* impacts if storm drains are not properly sized.

The project site is currently vacant, and buildout of the project site would result in a significant increase in stormwater runoff that would ultimately discharge into the Petaluma River. Onsite drainage will be collected via a system of onsite storm drains that will be conveyed to bioswales for stormwater treatment with discharge into the Petaluma River via two existing discharge drains. Although the storm drain size is not delineated on the preliminary project maps, they would need to be sized to adequately handle all post-construction flows resulting from site development, as well as any offsite flows that may be within the site's drainage area. With adequate storm drain sizing and compliance with City engineering requirements, project runoff would not exceed storm drain capacities. Final engineered improvement plans and storm drainage calculations will be reviewed by the City and the Sonoma County Water Agency to ensure that the drainage system is adequately sized and designed to handle all stormwater flows.

The project would not alter the course of a stream or river as existing drainage patterns would be maintained with stormwater runoff being discharged into the Petaluma River. Thus, there would be no alteration to the Petaluma River or substantial erosion or siltation due to alteration of a stream course. Therefore, the subject project would not result in impacts due to alteration of a drainage pattern or stream course. Effects of increased stormwater drainage on flood elevations as a result of future development of the project site are discussed below under Impact 4.6-3.

The City's General Plan policies 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 (8-P-36). Typically, this is required in areas of the City where project development may result in increased runoff that could result in offsite or downstream flooding. The project site is located at the downstream end of the Petaluma River in an area that has not been historically subject to flooding. The City has been in the process of re-mapping its flood insurance rate maps with the Federal Emergency Management Agency, using the City's XPSWMM storm water modeling system. According to City staff review, generally, storm water detention provides benefit on projects in the upper reaches of the Petaluma River and its tributaries. The City's XPSWMM model and recent City staff review of hydrological studies

for other projects within the city, i.e., the Deer Creek Plaza Shopping Center project, show that storm water detention in the lower reaches of the Petaluma River within the City does not provide a benefit and is not necessary (Curt Bates, City Engineer, personal communication, April 2013). City staff also reports that their review of the Deer Creek analysis revealed that detention can slightly increase the 100-year flood surface elevations of the Petaluma River if detained runoff is allowed to enter the Petaluma River at or near peak discharge volumes of the entire river watershed (Ibid.). Therefore, the City will not require onsite detention or require that there be no net increase in stormwater runoff (Curt Bates, City Engineer, personal communication, April 2013).

Mitigation Measures

Implementation of Mitigation Measure HYDRO-1 below will insure adequate storm drainage system design and reduce potential stormwater drainage impacts to a less-than-significant level. Payment of the City's Storm Drainage Impact Fee also will be required.

HYDRO-1: Prepare final drainage plan as part of the Subdivision Improvement Plans that provide calculations and documentation that the site storm drain system and discharge culverts have adequate capacity to serve the project and watershed area at full buildout. The storm drain system design shall be reviewed and approved by the Sonoma County Water Agency.

Water Quality

Impact 4.6-2 – *Water Quality & Stormwater Discharge:* Grading activities and future runoff from the developed project site could result in non-point and point source pollution into the Petaluma River, if not properly controlled. This is a *potentially significant* impact since the river is listed as impaired for nutrients, pathogens and sediment.

Grading activities and future runoff from the developed project site could result in non-point and point source pollution into the Petaluma River, if not properly controlled. This is considered a potentially significant impact, particularly since the river is listed as impaired for nutrients, pathogens and sediment. Non-point source pollution includes potential sediments from construction activities, as well as, oil and exhaust from cars that settles on City streets and parking lots and is washed into local waterways during storm events. Point source pollution could occur through the planned stormwater discharge into the river.

Construction & Grading. Site development and grading could increase the potential for erosion and the inadvertent transport of sediments into the Petaluma River that could lead to increased turbidity and sedimentation in the river, which is listed as impaired for sediments. Project plans show the site being graded (with approximately 146,000 cubic yards of excavation) in order to redistribute onsite materials to create a “balanced” grading for the site,

which will result in fills of approximately two feet or less throughout most of the southern portion of the site, except adjacent to the southern terminus of the project north-south road where three to ten feet of fill is planned along the planned road corridor and along a portion of the northern edge of the proposed Riverfront Park. Mass grading of the entire site will be conducted as part of the subdivision improvements to redistribute onsite soils, creating a balanced massing grading of the site and to enable completion of all subdivision improvements and better accommodate future development phases. Each phase may also require final grading for development sites.

Total project grading to create final grades would consist of approximately 146,000 cubic yards of cut, nearly half of which will be hauled offsite under a separate permit issued by the City for use in the Caltrans Highway 101 improvement project that is currently underway. This level of grading could result in sediments reaching the Petaluma River if not adequately controlled, which would be considered a potentially significant impact. Due to the proximity to the river, construction of trails at the proposed Riverfront Park could also lead to erosion and sedimentation into the river if not properly controlled, although construction activities would be minimal for the park improvements.

Increased sediments into the river could degrade the aquatic environment and habitats. In addition, construction activities would introduce the potential for fuel or hazardous material spills on the project site. The potential degradation of surface water quality through erosion or through fuel/hazardous material spills during project construction would represent a potentially significant impact.

In accordance with requirements of the Grading and Erosion Control regulations (Municipal Code Chapter 17.31), project grading would be subject to City approval of a grading permit, which includes an approved erosion control plan. For projects over one acre in size, including the proposed mass grading and likely, most subsequent development phases, preparation of a Stormwater Pollution Prevention Plan (SWPPP) is required pursuant to the State's NPDES program. The purpose of a SWPPP is to identify sources of sediment and other pollutants that affect the quality of stormwater discharges and to describe and ensure the implementation of BMPs to reduce or eliminate sediment and other pollutants in stormwater as well as non-stormwater discharges. For projects over one acre in size, a Notice of Intent also is filed with the SWPPP to the RWQCB.

An erosion control plan has not yet been prepared, but the Applicant's engineer has indicated potential erosion control measures that will be used during construction. Fiber rolls, silt fences and fiber mats will be installed on all slopes. Catchment and settlement ponds will be constructed to contain silt being deposited at temporary outlets. Temporary outlets will be rocked with silt control BMPs. Construction road access will be rocked to prevent tracking of material onto the public right of way.

Preparation and implementation of the SWPPP and required erosion control plan will ensure that project development would not cause any increase in sedimentation, turbidity, or hazardous material concentrations within downstream receiving waters. Monitoring would be required for the implementation of the project's approved SWPPP, with a particular focus on construction period erosion control. Design requirements and implementation measures for minimizing project-generated erosion and for controlling fuel/hazardous material spills would be set forth in the SWPPP, in accordance with State and RWQCB design standards. It has been demonstrated that these measures, when properly designed and implemented, can reduce effects on the quality of stormwater runoff from construction sites to less-than-significant levels. The SWPPP for the subdivision improvements shall include the proposed Riverfront Park trail and improvements.

Post-Construction Operations. Upon completion of construction of all phases, stormwater runoff could result in discharge of non-point source pollutants via stormwater discharge into the Petaluma River, which could result in degradation of water quality. Non-point source pollution includes oils, grease, and exhaust from cars that settles on City streets and parking lots and are carried by runoff into storm drains and ultimately the Petaluma River during storm events. This could result in a long-term, incremental increase in water quality degradation within the Petaluma River, which is a potentially significant impact.

A stormwater mitigation plan has been prepared by the applicant for treatment of runoff from subdivision improvements, including streets, parks and open areas. The proposed subdivision plans include a number of "Low Impact Development" (LID) BMPs for improvements within the public right-of-way to protect water quality. These BMPs include interceptor trees and streetside bioretention, including directing stormwater runoff to bioswales, tree box filters, and open space areas and use of porous pavement. According to the project's "Storm Water Mitigation Report" (Steven J. Lafranchi and Associates, March 2011), treatment swales ranging in length from 60 to 120 feet and having a bottom width of five feet would be adequate to treat impervious surface runoff. Storm water calculations will determine the final treatment and volume capture requirements that will dictate the extent of these permanent BMP's. Proposed outlets will be constructed with permanent rock outfalls unless connected to an existing storm system.

According to the stormwater report, each residential lot will be designed so rainwater leaders will disperse to vegetated swales or landscaped areas. Future development consists of a number of different uses (single-family residential, town houses, office buildings, a hotel, mix-use in the Central Green, a surface parking lot). Each type of private development will utilize BMP's that are suitable for the construction type and constraints, which may include interceptor trees, impervious area disconnection, structural soil bioretention planters, and flow-through-planters. Each future development phase will be required to submit plans and detailed calculations to show that requirements for post-construction runoff treatment have been met. Site-specific development plans have not yet been prepared. Subsequent development phases will be required to submit stormwater plans and detailed calculations to

demonstrate that the requirement 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.

The project proposes discharge of drainage into the Petaluma River via two existing storm drain outlets, which could result in water quality degradation. Any sediments or pollutants generated by construction activities will be contained through implementation of Stormwater Pollution Prevention Plans, erosion control measures, and design of the drainage system to pre-filter pollutants before discharge, as discussed in subsection 6f below. Additionally, development of the planned subdivision improvements (streets, utilities, parks) and subsequent development phases would be subject to City stormwater management regulations and would be required to implement treatment measures for post-construction runoff so that water quality is protected.

Modified or new stormwater waste discharge requirements may be required from the Regional Water Quality Control Board (RWQCB) due to the intensification of land use at the site and increased runoff with future development. According to the Basin Plan, the Regional Board establishes and enforces waste discharge requirements for point and non-point sources of pollutants at levels necessary to meet numerical and narrative water quality objectives. In setting waste discharge requirements, the Regional Board will consider, among other things, the potential impact on beneficial uses within the area of influence of the discharge, the existing quality of receiving waters, and the appropriate water quality objectives. Under the state's Porter-Cologne Water Quality Control Act, any person discharging or proposing to discharge waste within the region (except discharges into a community sewer system) that could affect the quality of the waters of the state is required to file a Report of Waste Discharge (ROWD). The Water Board reviews the nature of the proposed discharge and adopts Waste Discharge Requirements (WDRs) to protect the beneficial uses of waters of the state. Waste discharge requirements could be adopted for an individual discharge, or a specific type of discharges in the form of a general permit. The Water Board may waive the requirements for filing a ROWD or issuing WDRs for a specific discharge where such a waiver is not against the public interest. NPDES requirements may not be waived.

Mitigation Measures

Implementation of Mitigation Measures HYDRO-2 through HYDRO-5 below, in accordance with City regulations, will reduce potential water quality impacts to a less-than-significant level. Grading and construction of site improvements, as well as development of each development phase, would require approval of a grading permit with an erosion control plan. All earthwork, grading, trenching, backfilling, and compaction operations shall be conducted in accordance with the City of Petaluma's Subdivision Ordinance (#1046, Title 20, Chapter 20.04 of the Petaluma Municipal Code). An erosion and sediment control plan will be required for the subdivision grading plans. The proposed subdivision grading and subsequent development phases that are over one acre in size will be required to prepare a SWPPP in accordance with

City and State regulations, and all future development will be subject to City grading and erosion control regulations.

HYDRO-2: In accordance with National Pollution Discharge Elimination System (NPDES) regulations, the developer shall prepare a Storm Water Pollution Prevention Plan (SWPPP) for grading and construction of subdivision improvements. The SWPPP shall also include provisions for the offsite Riverfront Park. All subsequent development phases over one acre in size shall prepare and implement a SWPPP. The SWPPP shall address erosion and sedimentation controls during all phases of construction, storage and use of fuels, and use and clean-up of fuels and hazardous materials. The SWPPP shall prohibit fueling, cleaning, or maintenance of equipment except in designated areas located as far from the river as possible. As a precaution, require contractor to maintain adequate materials onsite for containment and clean-up of any spills. The developer shall provide approval documentation from the RWQCB to the City verifying compliance with NPDES requirements. Acceptable proof of compliance is the Notice of Intent with a WDID number or other equivalent documentation.

HYDRO-3: The applicant shall prepare and implement an erosion control plan for the subdivision grading and each subsequent development phase site plan. The plan shall be reviewed and approved by the City of Petaluma prior to issuance of a grading permit for the proposed development. 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 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. Catchment and settlement ponds will be constructed to contain silt being deposited at temporary outlets. Temporary outlets will be rocked with silt control. Fiber rolls, silt fences and fiber mats will be installed on all slopes.

HYDRO-4: The applicant shall prepare and implement an erosion control plan for construction of the offsite trail and improvements for the Riverfront Park, including, but not limited to: installing hay bales or appropriate temporary silt fencing adjacent to the perimeter of the work area to prevent inadvertent transport of sediments into the Petaluma River; limiting ground disturbance and vegetation removal during construction; conducting work prior to the rainy season; protecting disturbed areas during the rainy season; and immediately revegetating disturbed areas.

HYDRO-5: Subsequent development phases over one acre in size shall submit plans and detailed calculations to show that requirements for post-construction runoff treatment have been met in accordance with the City's stormwater management regulations.

Flood Hazards

Impact 4.6-3 – Flood Hazards: Future structures at the project site would not be subject to hazards associated with flooding of the Petaluma River or sea level rise, although portions of the planned riverfront park may be inundated in the future due to sea level rise. This is considered a *less-than-significant* impact, as no habitable structures will be affected.

As indicated in the Environmental Setting subsection above, the project site is located in Panel 1001 of the February 19, 2014 Flood Rate Insurance Map. The Base Flood Elevation surrounding the property as depicted on this map is 9.0 feet. As previously indicated, FEMA has completed the draft San Francisco Bay Area Coastal Study that remaps the flood hazards along coastal areas within the San Francisco Bay. The draft maps indicate that the 100-year flood surface elevation in the southern portion of Petaluma, including the Petaluma River fronting the Riverfront project site, increase from 9.0 feet (NAVD) to 10.0 feet (NAVD). The project site is located outside of the 100-year flood area on both maps and no structures would be located within the 100-year or 500-year floodplain. The existing and final elevations within the proposed development areas are 12+ feet.

The effect of increased impervious surfaces on flood elevations as a result of future development accommodated by the City's General Plan 2025 was evaluated as part of the General Plan EIR. Based on the recent reviews and analyses in the General Plan EIR, the level of runoff generated by the proposed project would not be at a level significant enough to cause a substantial change in flood flow elevations or area of floodplain.

As previously mentioned, several studies indicate a potential for sea levels to rise by an estimated 3 to 6 feet by future year 2100. Due to the project's elevation, even under sea level rise of 6 feet, the habitable structures would remain sufficiently elevated and would avoid the direct adverse effects of sea level rise. The project site is somewhat protected from the potential direct flooding effects of sea level rise due to existing elevation changes between the project site and adjacent area along the river.

The portion of the project site planned for the Riverfront Park is adjacent to the Petaluma River and is owned by the State of California (under the jurisdiction of the State Lands Commission). The project proposes a passive "Riverfront Park" in this area on approximately 3.6 acres. Portions of the proposed riverfront trail may be inundated during high tide under future year sea level rise greater than three feet. However, given the intended use of the Riverfront Park, the adverse effects associated with sea level rise in the future would be less than significant.

The Riverfront Park that is proposed to be developed on State Lands property would be a compatible land use that would accommodate marginal sea level rise, without exposing

buildings or development to increased hazards. It is understood that the State Land Commission, as the land owner for the southern portion of the proposed Riverfront Park, adjacent to the Petaluma River, may require expanded or additional information in order to enter into a lease for the proposed Riverfront Park.

Mitigation Measures

None are required as a significant impact has not been identified.