This section of the Draft Environmental Impact Report (Draft EIR; DEIR) identifies the hydrologic resources, existing drainage conditions, and surface and groundwater quality of the General Plan Update (GPU) Planning Area. This section also evaluates the potential impacts of implementing the proposed General Plan Update and its associated project components with respect to flooding, drainage, erosion, water quality, and water supply (as it relates to groundwater resources) and identifies appropriate mitigation measures to lessen the identified impacts, where necessary. The reader is referred to Section 4.12, Public Services and Utilities, for further discussion of water supply. The reader is also referred to Section 4.7, Biological Resources, for a discussion of wetlands.

4.9.1 EXISTING SETTING

CLIMATE AND PRECIPITATION

Contra Costa County has a moderate climate, similar to a Mediterranean climate. Measurable rainfall recorded annually in the county seat, the City of Richmond, averages about 21.8 inches per year, with the majority falling between October and April. Average temperatures are mild and generally range from 50 and 66 degrees Fahrenheit in Richmond (Contra Costa County, 2005). Snow is rarely seen in Contra Costa County. Marine fog is more characteristic of the county, occurring throughout the year, particularly in the winter months. Fog usually occurs in the morning hours and may continue for several days if atmospheric conditions are stagnant.

TOPOGRAPHY AND HYDROLOGIC SOILS GROUPS

The topography of the Planning Area is characterized by upland terrain of the East Bay Hills in the eastern portions of the Planning Area and lowland terrain with subdivisions on valley lands and bay lands in the western portions of the Planning Area. The East Bay Hills are a segment of the Coast Ranges with northwesterly-trending, moderate to steeply sloping hillsides and surface elevations ranging from 0 to 75 percent slopes. The ground surface elevation in the vicinity of the Planning Area ranges from mean sea level (msl) to 790 feet above msl.

The U.S. Department of Agriculture, Natural Resource Conservation Service (NRCS) (2010) identifies 24 mapped soil series units within the Planning Area. These soils and their associated hydrologic units are described in **Table 4.9-1** below.

TABLE 4.9-1
PLANNING AREA SOILS

Soil Name	Approximate Percentage of Land in Planning Area*	Runoff Potential
Altamont-Fontana Complex, 30 to 50 percent slopes	0.6	D
Botella Clay Loam, 2 to 9 percent slopes	4.7	B
Clear Lake Clay	6.5	D
Conejo Clay Loam, 0 to 2 percent slopes	0.4	C
Conejo Clay Loam, 2 to 5 percent slopes	1.8	C
Cropley Clay, 2 to 5 percent slopes	3.3	D
Cut and Fill Land – Diablo Complex, 9 to 30 percent slopes	5.5	D

Soil Name	Approximate Percentage of Land in Planning Area*	Runoff Potential
Cut and Fill Land – Los Osos Complex, 9 to 30 percent slopes	7.6	D
Cut and Fill Land – Millsholm Complex, 9 to 30 percent slopes	9.7	D
Cut and Fill Land – Millsholm Complex, 30 to 50 percent slopes	6.7	D
Diablo Clay, 15 to 30 percent slopes	2.6	D
Diablo Clay, 30 to 50 percent slopes	1.0	D
Joice Muck	0.7	D
Lodo Clay Loam, 9 to 30 percent slopes	0.2	–
Lodo Clay Loam, 30 to 50 percent slopes	4.8	D
Los Gatos Loam, 15 to 30 percent slopes	0.4	–
Los Gatos Loam, 30 to 50 percent slopes	1.9	C
Los Osos Clay Loam, 15 to 30 percent slopes	7.4	–
Los Osos Clay Loam, 30 to 50 percent slopes	14.1	C
Los Osos – Los Gatos Complex	1.2	C
Millsholm Loam, 15 to 30 percent slopes	2.7	–
Millsholm Loam, 30 to 50 percent slopes	14.1	D
Tierra Loam, 2 to 9 percent slopes	0.9	D
Tierra Loam, 9 to 15 percent slopes	0.1	D
Waterways	1.1	–

Source: NRCS, 2010
**Excludes submerged areas of the Planning Area.*

The NRCS uses hydrologic soil groups to categorize soils according to their runoff potential. These groups are defined as:

Group A: Low runoff potential soils having high infiltration rates even when thoroughly wetted and consisting chiefly of deep, well-drained sands or gravels. These soils have a high rate of water transmission.

Group B: Soils having moderate infiltration rates when thoroughly wetted and consisting chiefly of moderately deep to deep, moderately well to well-drained sandy-loam with moderately fine to moderately coarse textures. These soils have a moderate rate of water transmission.

Group C: Soils having a low infiltration rate when thoroughly wetted and consisting chiefly of silt-loam soils with a layer that impedes downward movement of water, or soils with moderately fine to fine texture. These soils have a slow rate of water transmission.

Group D: High runoff potential soils having very slow infiltration rates when thoroughly wetted and consisting chiefly of clay soils with a high swelling potential, soils with a permanent high water table, soils with a clay pan or clay layer at or

near the surface, and shallow soils over nearly impervious material. These soils have a slow rate of water transmission.

As shown in **Table 4.9-1** above, the Planning Area contains soils from NRCS Hydrologic Soil Groups B, C, and D (NRCS, 2010).

SURFACE HYDROLOGY

Contra Costa County is bounded by the San Francisco Bay-Delta System, which is considered one of the most important waterbodies in California. The San Francisco Bay-Delta System in Contra Costa County consists of the San Francisco Bay and San Pablo Bay to the west, Suisun Bay to the north, the Sacramento and San Joaquin River Delta Channels to the north, and several small tributaries throughout the county. There are 29 watershed systems throughout Contra Costa County. Western Contra Costa, where the GPU Planning Area is located, consists of nine major watersheds: San Pablo Creek, Wildcat Creek, Pinole Creek, Refugio Creek, Rheem Creek, Rodeo Creek, Baxter/Cerrito Richmond Drainages, Garrity Creek, and the Carquinez Strait Drainages. The hydrologic processes of these watersheds are influenced by rainfall runoff, snowmelt, and base flow from groundwater, reservoir releases, and water diversions. The largest watershed in western Contra Costa County is the San Pablo Creek watershed, which covers approximately 43.6 square miles of land. The headwaters of the San Pablo Creek watershed begin in the City of Orinda. Main tributaries include San Pablo Creek, Cascade Creek, Bear Creek, Castro Creek, Wilkie Creek, and the San Pablo and Briones reservoirs (Contra Costa County, 2003). **Figure 4.9-1** illustrates the location of the Contra Costa County watersheds (UC Berkeley, 2010).

The GPU Planning Area is located within the Pinole Creek watershed, which encompasses approximately 15.2 square miles (9,705 acres) of land in western Contra Costa County. The primary waterbodies within the watershed include Pinole Creek, Pavson Creek, Oak Moth Creek, Costa Creek, Lagoons Creek, Pereira Creek, April Creek, and Cottonwood Creek. Pinole Creek bisects the Planning Area and is the primary surface waterbody within the city. The Pinole Creek headwaters begin in the Briones Hills and follow a northwesterly direction for approximately 11 miles before draining into San Pablo Bay. The creek crosses through a variety of land uses including urban areas, East Bay Municipal Utility District (EBMUD) protected watershed and open space land, and rural unincorporated agricultural lands. Pinole Creek enters the Planning Area as it exits the East Bay Hills, crossing underneath Interstate 80 (I-80) and moving northward through the city limits before reaching the bay. The U.S. Army Corp of Engineers (USACE) conducted extensive work on Pinole Creek in the 1950s to control flooding in Pinole's downtown area (Contra Costa County, 2003).

DRAINAGE AND FLOODING

The GPU Planning Area contains both natural waterways and man-made features (e.g., channels, storm drain inlets, siphons, overchutes [spillways], v-ditches [ditches with little or no flat bottom], detention basins) that convey drainage. Drainage primarily flows in an east and west direction into the Pinole Creek watershed and eventually into San Pablo Bay.

A large portion of the GPU Planning Area is designated by the Federal Emergency Management Agency as Zone X. Zone X is defined as areas outside the 1 percent annual chance floodplain, or 100-year floodplain, and is considered to be at moderate to low risk of flooding. The entire Pinole Creek corridor and the majority of the San Pablo Bay shoreline are designated by FEMA as being within the 100-year floodplain. In addition, portions of the Pinole Creek corridor are located within the 500-year floodplain (see **Figure 4.9-2**).

The city experiences infrequent and localized flooding and standing water in streets, intersections, and the sanitation facility during brief intense storms when runoff exceeds storm sewer capacity. However, the risk of flooding in Pinole is considered minimal. Areas that are susceptible to localized flooding within the city include the Pinole/Hercules Water Pollution Control Plant (WPCP) and the freeway underpass at Interstate 80 and Pinole Valley Road. The WPCP is impacted by flooding of the creek when tidal surge and heavy rain runoff occurs (City of Pinole, 2009). The ability for the WPCP to vent/drain is hampered by these conditions. Flooding is also caused along Pinole Creek when the creek bed is littered with debris. During heavy rains the debris is gathered into natural dams, providing the opportunity for debris plugs adversely affecting the creek's normal flow. The backup created by debris flows then causes the water to flow over and around the infrastructure designed to accommodate the normal runoff of water. During heavy rains when the storm drains are clogged with debris, there is also the potential for the freeway underpass at I-80 and Pinole Valley Road to flood (City of Pinole, 2009).

The City of Pinole owns and maintains 34 miles of storm drain infrastructure. The City does not maintain v-ditches that are located on private property. The general condition of the City's storm drains is good (Dudek, 2009).

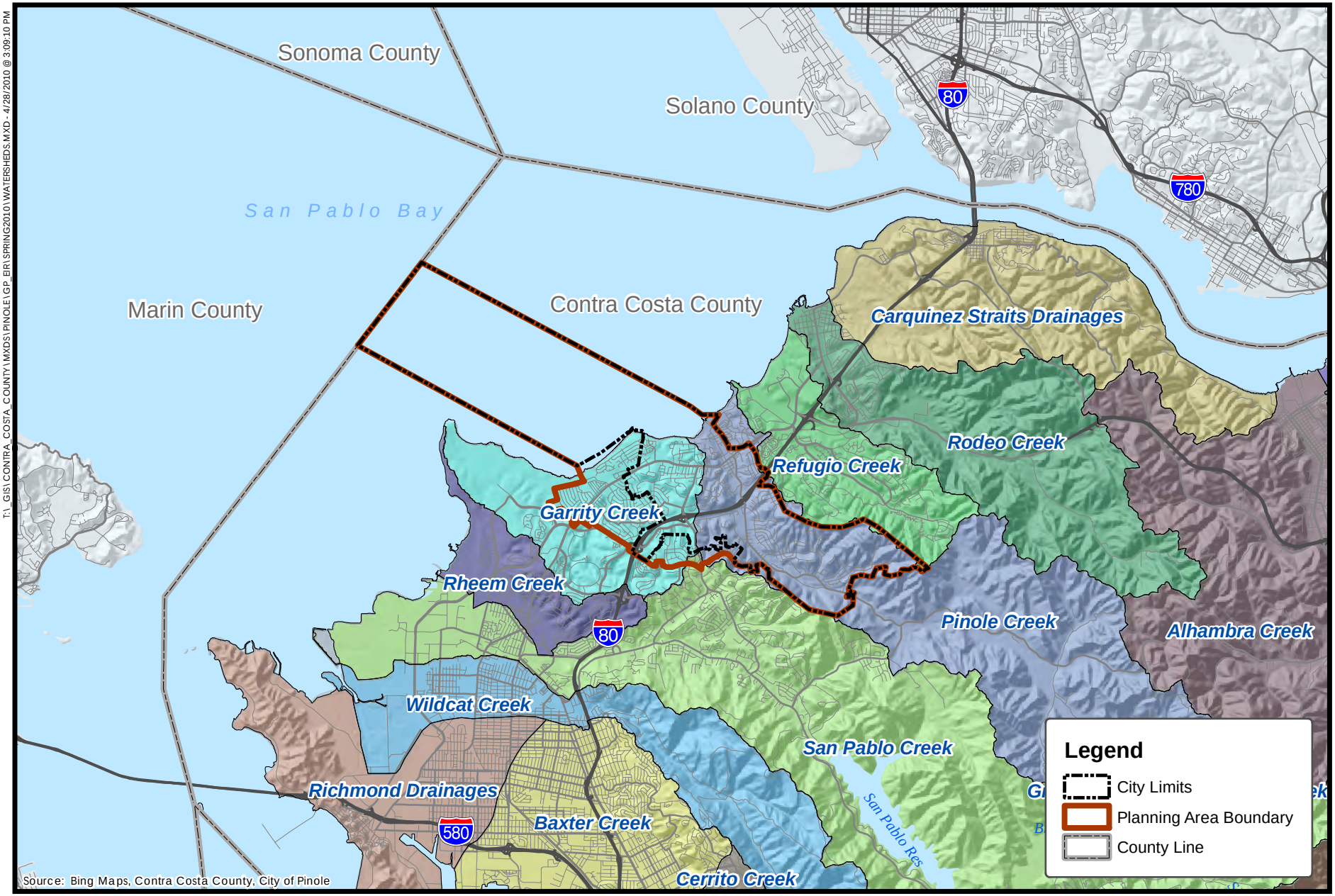

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Figure 4.9-1
Watershed Map

PMC

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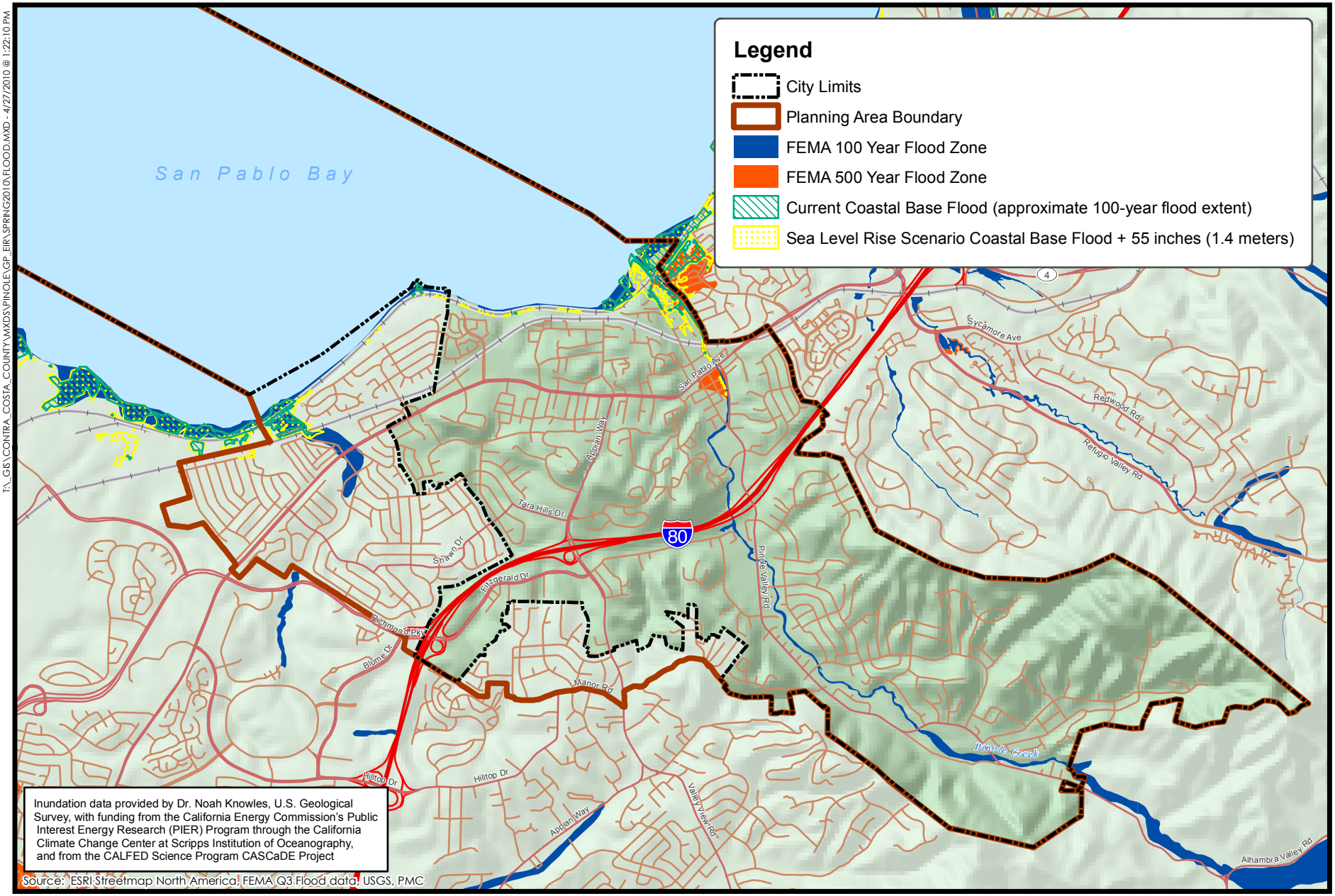

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Figure 4.9.2
Flood Map

PMC®

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DAM FAILURE

Dams are man-made structures built for a variety of uses including flood protection, power, agriculture, water supply, and recreation. When dams are constructed for flood protection, they usually are engineered to withstand a flood with a computed risk of occurrence. For example, a dam may be designed to contain a flood at a location on a stream that has a certain probability of occurring in any one year. If a larger flood occurs, then that structure will be overtopped. Overtopping is the primary cause of earthen dam failure. Failed dams can create floods that are catastrophic to life and property as a result of the tremendous energy of the released water. A catastrophic dam failure could easily overwhelm local response capabilities and require mass evacuations to save lives.

Dam inundation zones generally follow the existing streams and drainage areas, and areas subject to flooding from a dam failure would likely be those areas located along these streams and drainages. Pinole itself does not have any navigable waters or dams.

Dam safety is regulated by the California Department of Water Resources, Division of Safety and Dams. All large reservoirs in Contra Costa County have been investigated and many have been strengthened (Contra Costa County, 2005). Further, the Office of Emergency Services (OES) has produced inundation maps and emergency plans covering various scenarios of dam failure in Contra Costa County (Contra Costa County, 2005).

GROUNDWATER HYDROLOGY

The GPU Planning Area does not have significant underlying groundwater resources and is not located within a recognized groundwater subbasin (DWR, 2003). Groundwater levels in the city can fluctuate over time due to variations in rainfall and water levels in nearby Pinole Creek. When groundwater levels are high, causing ground saturation, groundwater seepage can enter structures through foundations. Groundwater seepage, which can damage property, is a common occurrence in the residential bayside area, and many residents do not have sump pumps to remove standing water from behind their houses. Saline conditions can further complicate problems from groundwater seepage.

The East Bay Municipal Utility District (EBMUD) provides domestic water service to the GPU Planning Area (described in more detail below). EBMUD is planning to operate a groundwater injection/extraction program for use during dry years. This program would be operated in the San Lorenzo area, which overlies the East Bay Plain Groundwater Subbasin (EBMUD, 2005).

WATER QUALITY

Surface Water

A number of different factors can contribute to the degradation of water quality. Much of the pollution affecting Pinole Creek comes from many small diffuse sources, or non-point sources, and includes the following:

- Stormwater Pollution – Stormwater runoff carries a variety of harmful substances used in urban environments, including fertilizers, pesticides, and automotive fluids, which are transported to local creeks and eventually into San Pablo Bay. Of particular concern is I-80, which crosses the watershed and carries thousands of cars each day. Runoff from I-80 flows directly into Pinole Creek.

- Illegal Dumping and Litter – There are several illegal dumping areas along Pinole Creek that regularly receive debris, including large items such as furniture and electronics equipment. These dumpsites include various road pullouts along Pinole Valley Road in the upper watershed and the reach of the creek behind the Pinole Valley Shopping Center. Dumped materials can break down and pollute water, and litter from streets and parks can also drift into the creek.

- Animal Waste – Of particular concern in the upper watershed is animal waste pollution from horse boarding facilities. Horse keeping is allowed without special permit on agriculturally zoned land in Contra Costa County or without specific limits on the number of horses allowable per acre.

- Sediment – Sediment erosion from private properties, including eroding hillsides, creek banks, dirt roads, and construction sites, contributes excessive sediment to the creek channel and is of particular concern within the watershed. Lack of technical assistance and the high cost of prevention techniques have been cited as obstacles to addressing this issue.

- Mosquito Abatement – The use of chemicals to eradicate mosquito populations within stagnant water adjacent to the creek channel may degrade water quality (City of Pinole, 2009).

In addition, a number of hazards are present in Pinole that potentially damage surface water quality, such as the leaking of 12 underground toxic storage tanks along San Pablo Avenue and leaking underground storage tanks along Appian Way and Pinole Valley Road. Other hazards, including environmental hazards such as earthquakes and flooding, all pose significant threats to water quality within the Planning Area. Potential hazards to the Planning Area are explored further in Section 4.6, Human Health/Risk of Upset, and Section 4.8, Geology and Soils.

Pinole Creek and San Pablo Bay, located in the Planning Area, are included on the Clean Water Act (CWA) Section 303(d) List of Water Quality Limited Segments as waterbodies that contain pollutants. Pinole Creek contains the pollutant diazinon, which is an insecticide used to control pests on crops. The potential sources of this pollution are urban runoff and stormwater sewers (SFBRWQCB, 2006). The San Francisco Bay Area Urban Creeks Pesticide Toxicity Total Maximum Daily Load (TMDL) was prepared for over 30 creeks and creek segments in the Bay Area, including Pinole Creek. This TMDL was approved by the USEPA in 2005 and by the State Water Resources Control Board in 2006 (SFBRWQCB, 2007).

A sediment source assessment and baseline water quality study for Pinole Creek was completed in 2005 by the San Francisco Estuary Institute on behalf of the Contra Costa Resource Conservation District. The study gathered data on hillslope, road, and streambed/bank sediment erosion and storage along the creek, nutrient concentrations in the creek, and water and sediment discharge to the flood control channel. According to the data, sediment erosion in the Pinole Creek watershed is occurring from three primary sources: (1) active landslides contributing about 61 percent of total annual average sediment supply to the creek; (2) active gullies contributing 17 percent; and (3) road-related sources contributing 14 percent. Sediments derived from creek bed and bank erosion are only minor contributors to the overall sediment budget of the watershed. The study also determined that the watershed is generally nitrogen-limited and suspended sediment export was approximately 2.5 times greater than the Bay Area average. Based on these results, the study made several recommendations for improving water quality and reducing sediment erosion, including encouraging implementation of land-use-specific sediment control measures, implementing projects to stabilize gully head cuts, planning

for creek setbacks where feasible, continuing water quality monitoring, and encouraging collaboration between interested parties (SFEI, 2005).

In 2002, Contra Costa County initiated a macro-invertebrate sampling program to assess water quality in Pinole Creek. The results from the first year of sampling have been compiled. Overall, the sampling found that segments of Pinole Creek owned by EBMUD had the best water quality, while the samples taken in the upper and lower watersheds were of lower quality (Urban Creeks Council, 2004).

San Pablo Bay contains the chemical and biological contaminants chlordane, DDT, dieldrin, dioxin compounds, exotic species, furan compounds, mercury, nickel, polychlorinated biphenyls (PCB), and selenium. The potential sources of these pollutants are multiple, including non-point sources, atmospheric deposition, and ballast water (SFBRWQCB, 2006). The San Francisco Bay Regional Water Quality Control Board prepared TMDLs for PCB and mercury in San Pablo Bay in 2003 and 2004, respectively. TMDLs for the remaining contaminants are under development or are planned for development in the future (SFBRWQCB, 2007).

Groundwater

The GPU Planning Area and surrounding region do not have significant underlying groundwater resources and are not located within a recognized groundwater subbasin (DWR, 2003). The nearest groundwater subbasin, the East Bay Plain Subbasin, is located approximately 3 miles to the southwest of the City of Pinole at its closest and is separated from the city by Franciscan Basement rock (DWR, 2003). The East Bay Plain Subbasin is characterized as a series of deep and shallow aquifers at very high levels. The San Francisco Regional Water Quality Control Board identified 13 distinct locations as areas of major groundwater pollution. These were identified as having plumes of contamination greater than 1,000 feet in length. Most contamination is due to release of fuels and solvents and appears to be restricted to the upper 50 feet of the subsurface (DWR, 2003).

DOMESTIC WATER SERVICE

Water Purveyors

The Planning Area is provided water service by the East Bay Municipal Utility District (EBMUD). EBMUD is a public agency that provides drinking water to 1.3 million people and wastewater systems for 640,000 people in portions of Contra Costa and Alameda counties. The service boundaries for the EBMUD drinking water system extend from the unincorporated communities of Crockett on the north to San Lorenzo on the south (including the cities of Oakland and Berkeley) and encompasses approximately 325 square miles. The EBMUD water system provides service to the entire GPU Planning Area. The wastewater system boundaries extend from Richmond on the north to San Leandro on the south and encompass approximately 83 square miles. The EBMUD wastewater system does not extend to the GPU Planning Area (EBMUD, 2005). See Section 4.12, Public Services and Utilities, for a discussion of wastewater service in the Planning Area.

Water Supplies

EBMUD's water supplies are obtained primarily from the Mokelumne River watershed (90 percent) and from local area watersheds (10 percent). Most of the water obtained from the Mokelumne watershed is derived from snowmelt from the Sierra Nevada mountain range and

local rainfall. Water acquired from local area watersheds is primarily derived from runoff and rainfall that is collected in reservoirs maintained by EMBUD.

EBMUD has water rights that permit the delivery of up to a maximum of 325 million gallons per day (mgd) from the Mokelumne River to EBMUD reservoirs. This permit is subject to the availability of Mokelumne River runoff and senior water rights of other users. Additionally, EBMUD receives 15 to 25 million gallons per day during normal hydrologic years from local area watersheds. Average daily water consumption for EBMUD was approximately 205 mgd in 2005.

EBMUD does not currently obtain any of its water supplies from groundwater sources. However, the district has identified increased water storage in groundwater aquifers as a potential future alternative water supply to meet demands in dry periods. This project, referred to as the Bayside Groundwater Project, would involve groundwater injection/extraction operations in the San Leandro/San Lorenzo area, several miles south of the Planning Area (EBMUD, 2005).

4.9.2 REGULATORY FRAMEWORK

FEDERAL

Clean Water Act

The Clean Water Act (CWA) regulates the water quality of all discharges into waters of the United States, including wetlands and perennial and intermittent stream channels. Section 401, Title 33, Section 1341 of the CWA sets forth water quality certification requirements for "any applicant applying for a federal license or permit to conduct any activity including, but not limited to, the construction or operation of facilities, which may result in any discharge into the navigable waters." Section 404, Title 33, Section 1344 of the CWA in part authorizes the U.S. Army Corps of Engineers to:

- Set requirements and standards pertaining to such discharges: subparagraph (e);
- Issue permits "for the discharge of dredged or fill material into the navigable waters at specified disposal sites": subparagraph (a);
- Specify the disposal sites for such permits: subparagraph (b);
- Deny or restrict the use of specified disposal sites if "the discharge of such materials into such area will have an unacceptable adverse effect on municipal water supplies and fishery areas": subparagraph (c);
- Specify type of and conditions for non-prohibited discharges: subparagraph (f);
- Provide for individual state or interstate compact administration of general permit programs: subparagraphs (g), (h), and (j);
- Withdraw approval of such state or interstate permit programs: subparagraph (i);
- Ensure public availability of permits and permit applications: subparagraph (o);
- Exempt certain federal or state projects from regulation under this Section: subparagraph (r); and

- Determine conditions and penalties for violation of permit conditions or limitations: subparagraph (s).

- Section 401 certification is required prior to final issuance of Section 404 permits from the U.S. Army Corps of Engineers.

Section 303(d) of the Clean Water Act requires that all states in the U.S. identify waterbodies that do not meet specified water quality standards and that do not support intended beneficial uses. Identified waters are placed on the Section 303(d) List of Impaired Waterbodies. Once placed on this list, states are required to develop a water quality control plan – called a total maximum daily load – for each waterbody and each associated pollutant/stressor.

National Pollutant Discharge Elimination System

As authorized by the Clean Water Act, the National Pollutant Discharge Elimination System (NPDES) Permit Program controls water pollution by regulating point sources that discharge pollutants into waters of the United States. It is the responsibility of the local water boards to preserve and enhance the quality of the state's waters through the development of water quality control plans and the issuance of waste discharge requirements (WDRs). WDRs for discharges to surface waters also serve as NPDES permits (SWRCB, 2009). The NPDES program is discussed in more detail below.

Total Maximum Daily Loads

Under CWA Section 303(d) and California's Porter-Cologne Water Quality Control Act of 1969, the State of California is required to establish beneficial uses of state waters and to adopt water quality standards to protect those beneficial uses. Section 303(d) establishes the total maximum daily load process to assist in guiding the application of state water quality standards. This process also requires the states to identify waters whose water quality is "impaired" (affected by the presence of pollutants or contaminants) and to establish a TMDL or the maximum quantity of a particular contaminant that a waterbody can assimilate without experiencing adverse effects on the beneficial use identified. TMDLs serve as a regulatory mechanism to identify and implement additional controls on both point and non-point source discharges in waterbodies that are impaired from one or more pollutants and are not expected to be restored through normal point source controls. Within California, the regional water quality control boards (RWQCB) generally prepare TMDLs for the impaired waterbodies under their jurisdiction. Implementation of the TMDL is accomplished through amendments.

Section 303(d) of the federal CWA requires states to identify the waters of the state that do not meet the CWA's national goal of "fishable, swimmable" and to develop "total maximum daily loads" (TMDLs) for such waters, with oversight of the U.S. Environmental Protection Agency (USEPA). The majority of the Planning Area is a "closed basin" that drains to the Buena Vista Lake Bed as its point of terminal discharge and is not affected by the CWA Section 303(d) List of Water Quality Limited Segments. However, as discussed above, the San Francisco Bay RWQCB has included Pinole Creek and San Pablo Bay, both located within the Planning Area, on their Clean Water Act (CWA) Section 303(d) List of Water Quality Limited Segments. Pinole Creek contains the pollutant diazinon and San Pablo Bay contains the contaminants chlordane, DDT, dieldrin, dioxin compounds, exotic species, furan compounds, mercury, nickel, PCBs, and selenium.

Federal Emergency Management Agency

The City of Pinole and Contra Costa County are participants in the National Flood Insurance Program (NFIP), a federal program administered by the Federal Emergency Management Agency (FEMA). Participants in the NFIP must satisfy certain mandated floodplain management criteria. The National Flood Insurance Act of 1968 has adopted, as a desired level of protection, an expectation that developments should be protected from floodwater damage of the Intermediate Regional Flood (IRF). The IRF is defined as a flood of a magnitude that has a 1 percent chance of occurring in any given year. It is also referred to as a 100-year return period flood, although such a flood may occur in any given year. The City of Pinole and Contra Costa County are occasionally audited by the California Department of Water Resources to ensure the proper implementation of FEMA floodplain management regulations.

STATE AND REGIONAL

Porter-Cologne Water Quality Act

The Porter-Cologne Water Quality Act governs the coordination and control of water quality in the state and includes provisions relating to non-point source pollution. The California Coastal Commission, pursuant to the coastal act, specified duties regarding the federally approved California Coastal Management Program. This law required that the State Water Resources Control Board, along with the California Coastal Commission, regional boards, and other appropriate state agencies and advisory groups, prepare a detailed program to implement the state's non-point source management plan on or before February 1, 2001. The law also requires that the state board, in consultation with the Commission and other agencies, submit copies of prescribed state and regional board reports containing information related to non-point source pollution, on or before August 1 of each year.

State Water Resources Control Board

Created by the State Legislature in 1967, the five-member State Water Resources Control Board (SWRCB) allocates water rights, adjudicates water right disputes, develops statewide water protection plans, establishes water quality standards, and guides the nine regional water quality control boards located in the major watersheds of the state. The joint authority of water allocation and water quality protection enables SWRCB to provide comprehensive protection for California's waters (SWRCB, 2009).

SWRCB is responsible for implementing the Clean Water Act and issues NPDES permits to cities and counties through the regional water quality control boards. The GPU Planning Area is located in a portion of the state that is regulated by the San Francisco Bay RWQCB. The San Francisco Bay RWQCB first issued a municipal stormwater NPDES permit to Contra Costa County and its 19 cities and towns, including the City of Pinole, in 1993.

San Francisco Bay Regional Water Quality Control Board

The San Francisco Bay Regional Water Quality Control Board (RWQCB) regulates surface water and groundwater quality in San Francisco Bay. The area under the RWQCB's jurisdiction comprises all of the San Francisco Bay segments extending to the mouth of the Sacramento-San Joaquin Delta (Winter Island near Pittsburg). In its efforts to protect surface waters and groundwaters of the San Francisco region, the RWQCB addresses region-wide water quality concerns through the creation and triennial update of a Water Quality Control Plan and adopts,

monitors compliance with, and enforces waste discharge requirements and National Pollutant Discharge Elimination System (NPDES) permits.

San Francisco Bay Regional Water Quality Control Plan (Basin Plan)

The Basin Plan is a master policy document that contains descriptions of the legal, technical, and programmatic bases of water quality regulation in the San Francisco Bay region. This plan describes the beneficial uses to be protected in these waterways, water quality objectives to protect those uses, and implementation measures to make sure those objectives are achieved. On July 17, 2007, the State Water Resources Control Board approved the Basin Plan amendment that established new water quality objectives for mercury in the tissues of Bay fish and a TMDL for mercury in San Francisco Bay. On March 29, 2010, the U.S. Environmental Protection Agency approved a TMDL for PCBs in San Francisco Bay. The Basin Plan amendment incorporating this TMDL and an implementation plan to achieve the TMDL was formerly adopted or approved by the San Francisco Bay Water Board (2/13/08), the State Water Resources Control Board (10/19/09), and the state Office of Administrative Law (2/15/10) (SWRCB, 2010).

General Permit – Stormwater

Under Phase I of the NPDES requirements, which started in 1990, the Regional Water Quality Control Boards have adopted NPDES stormwater permits for medium (serving between 100,000 and 250,000 people) and large (serving more than 250,000 people) municipalities. As part of Phase II, SWRCB adopted a General Permit for the Discharge of Storm Water from Small MS4s (WQ Order No. 2003-0005-DWQ) to provide permit coverage for smaller municipalities, including non-traditional Small MS4s, which are governmental facilities such as military bases, public campuses, and prison and hospital complexes. The MS4 permits require the discharger to develop and implement a stormwater management plan/program with the goal of reducing the discharge of pollutants to the maximum extent practicable (MEP). MEP is the performance standard specified in Section 402(p) of the Clean Water Act. The management programs specify what best management practices (BMPs) will be used to address certain program areas. The program areas include public education and outreach, illicit discharge detection and elimination, construction and post-construction, and good housekeeping for municipal operations (SWRCB, 2009).

The City of Pinole Department of Public Works has jurisdiction over stormwater management in the City of Pinole. The Contra Costa County Department of Public Works has jurisdiction over the remainder of the GPU Planning Area.

The City's Department of Public Works is a co-permittee of the Contra Costa County Clean Water Project, which binds the City to uphold the federal legislation entitled from the National Pollution Discharge Elimination System Act and the Clean Water Act. The Public Works Department monitors compliance with the Contra Costa County Clean Water Program, including compliance with NPDES permits from commercial activities, construction sites, and private discharges. To ensure compliance with the Clean Water Program, the City follows compliance guidelines found in the Contra Costa County *Stormwater C.3. Guidebook* and the best management practices set forth by the Public Works Department for a variety of land use activities throughout the city.

The City of Pinole is a joint participant with Contra Costa County's NPDES permit. The permit was renewed in June 1998 and allows the City to discharge urban runoff from Municipal Separate Storm Sewer Systems (MS4s) in their municipal jurisdiction. The permit requires that the City impose water quality and watershed protection measures for all development projects. The

NPDES also requires a permit for every new construction project that implements the following measures:

- Eliminate or reduce non-stormwater discharges to stormwater systems and other waters of the nation;
- Develop and implement a program stormwater pollution prevention plan (SWPPP); and
- Perform inspections of stormwater control structures and pollution prevention measures.

General Permit – Construction

In addition, under Phase II requirements, dischargers in any location whose projects disturb 1 or more acres of soil, or whose projects disturb less than 1 acre but are part of a larger common plan of development that in total disturbs 1 or more acres, are required to obtain coverage under the statewide General Permit for Discharges of Storm Water Associated with Construction Activity (Construction General Permit, 99-08-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 the facility. The Construction General Permit requires the development and implementation of a stormwater pollution prevention plan (SWPPP). The SWPPP should contain a site map(s) which shows the construction site perimeter, existing and proposed buildings, lots, roadways, stormwater collection and discharge points, general topography both before and after construction, and drainage patterns across the project. The SWPPP must list which best management practices the discharger will use to protect stormwater runoff and the placement of those best management practices (SWRCB, 2009).

On September 2, 2009, the SWRCB adopted a new NPDES Construction General Permit that will become effective on July 1, 2010 and will replace Order 99-08-DWQ. The new Permit has some significantly different requirements from the existing permit. Under the existing Permit, dischargers who implement BMPs to the best of their ability are deemed to be in compliance with the Permit. The new Permit, however, sets quantitative standards that must be achieved, regardless of the BMPs that are implemented. In addition, whereas the existing Permit relies on discharger-developed SWPPPs, as its primary compliance mechanism, the effect of SWPPPs is much more limited under the new Permit. Significant changes and additions to the new Permit include a new risk-based permitting approach, numeric action levels and numeric effluent limitations, post-construction standards, increased BMP requirements, Rain Event Action Plans, increased monitoring and reporting requirements, certification requirements for key project personnel, and new penalties for violations of permit conditions.

General Permit – Industrial Activities

The SWRCB has also issued a statewide General Permit (Water Quality Order No. 97-03-DWQ) for regulating stormwater discharges associated with industrial activities. This General Permit requires the implementation of management measures that will achieve the performance standard of best available technology (BAT) economically achievable and best conventional pollutant control technology (BCT). It also requires the development of an SWPPP and a monitoring plan and the filing of an annual report.

General Permit – Dewatering and Other Low-Threat Discharges

Certain actions during construction may also need to conform to a General Permit (Water Quality Order No. 5-00-175) that regulates dewatering and other low-threat discharges to surface waters, provided that they do not contain significant quantities of pollutants and are either (1) four months or less in duration, or (2) the average dry weather discharge does not exceed 0.25 mgd. Examples of activities that may require coverage under this General Permit include well development water, construction dewatering, pump/well testing, pipeline/tank pressure testing, pipeline/tank flushing or dewatering, condensate discharges, water supply system discharges, and other miscellaneous dewatering/low-threat discharges. However, the actions applicable to development of a given site may already be covered under the Construction General Permit, and therefore separate coverage under this General Permit is not always required.

LOCAL

East Bay Municipal Utilities District Urban Water Management Plan

An Urban Management Plan (UWMP) is required by the California Urban Water Management Planning Act (CUWMPA), which was sponsored by EBMUD in the early 1980s. Section 10610.4 of the CUWMPA specifies that "urban water suppliers shall be required to develop water management plans to actively pursue the efficient use of available supplies." The CUWMPA became part of the California Water Code with the passage of Assembly Bill 797 in 1983. Every urban water supplier providing more than 3,000 acre-feet of municipal water annually, or providing water to more than 3,000 customers, is required by the CUWMPA to prepare and adopt a UWMP. The CUWMPA has been amended by various assembly and senate bills which expanded the issues to be addressed in the UWMP. The state's policy, declared the CUWMPA, is to achieve conservation and efficient use of urban water supplies to protect both the people of the state and their water resources.

EBMUD adopted its first UWMP on November 26, 1985. Since 1985, the plan has been revised and updated every five years. EBMUD's Board of Directors adopted a revised UWMP in 1991, 1996, 2001, and 2005. The EBMUD UWMP is designed to satisfy the requirements of the Urban Water Management Planning Act and also to provide the public with a report on EBMUD's progress in implementing conservation and water recycling programs and securing supplemental water supply sources. The UWMP 2010 Update is under preparation and scheduled for submission to the Department of Water Resources by July 1, 2010.

Contra Costa Clean Water Program Municipal Regional Permit and Stormwater C.3 Guidebook

In October 2009, the San Francisco Bay RWQCB adopted a Municipal Regional Permit (MRP) governing discharges from municipal storm drains operated by 76 local government entities, including those in western and central Contra Costa County. Provision C.3 of the MRP applies to any development project which will create 10,000 square feet or more of impervious area. The C.3 requirements are separate from, and in addition to, requirements for erosion and sediment control and for pollution prevention measures during construction.

A Stormwater Control Plan that complies with the Contra Costa Clean Water Program *Stormwater C.3. Guidebook* is required for applications to subdivide land where the resulting project could create a total amount of impervious area in excess of the threshold. The guidebook regulations require that new development projects incorporate features that control stormwater runoff to reduce the quantity of pollutants introduced into the storm drain system

and waterways. These features are designed to slow the rate of stormwater flow. Requirements specify that project site designs must minimize the area of new roofs and paving and that, where feasible, pervious surfaces should be used instead of paving so that runoff can infiltrate to the underlying soil. The C.3 requirements also state that runoff from impervious areas must be captured and treated. The MRP specifies the sizes and types of facilities that may be used. In addition, project applicants must prepare plans and execute agreements to ensure the stormwater treatment and flow-control facilities are maintained in perpetuity (Contra Costa Clean Water Program, 2010).

City of Pinole Stormwater Management and Discharge Control Ordinance

Maintenance and annual inspection of stormwater treatment facilities are required by the City of Pinole Stormwater Management and Discharge Control Ordinance, found in Chapter 8.20 of the City's Municipal Code. The ordinance protects and enhances the water quality of Pinole's watercourses pursuant to, and consistent with, the Porter-Cologne Water Quality Control Act and the federal Clean Water Act. The regulations in the ordinance carry out the conditions in the City's National Pollutant Discharge Elimination System permit that require implementation of appropriate source control and site design measures and stormwater treatment measures for projects that create or replace 10,000 square feet or more of impervious surface. Regulations contained in the ordinance are intended to minimize non-stormwater discharges, minimize increases in non-point source pollution, control the discharge to the City's stormwater system from spills, dumping, or disposal of materials other than stormwater, and reduce stormwater runoff rates and volumes and non-point source pollution whenever possible.

City of Pinole Municipal Code

Chapter 15.48 of the City Municipal Code was adopted with the intent to prevent floodplain hazards. In order to accomplish its purposes, Chapter 15.48 includes methods and provisions for:

1) Restricting or prohibiting uses which are dangerous to health, safety, and property due to water or erosion hazards, or which result in damaging increases in erosion or flood heights or velocities;

2) Requiring that uses vulnerable to floods, including facilities which serve such uses, be protected against flood damage at the time of initial construction;

3) Controlling the alteration of natural floodplains, stream channels, and natural protective barriers, which help accommodate or channel floodwaters;

4) Controlling filling, grading, dredging, and other development which may increase flood damage; and

5) Preventing or regulating the construction of flood barriers which will unnaturally divert floodwaters or which may increase flood hazards in other areas. (Ord. 511 § 2 (Exh. A) (part), 1988).

4.9.3 IMPACTS AND MITIGATION MEASURES

STANDARDS OF SIGNIFICANCE

Based on Appendix G of the California Environmental Quality Act (CEQA) Guidelines, the proposed project would result in a significant impact to hydrology or water quality if it would:

1) Violate any water quality standards or waste discharge requirements.

2) Substantially deplete groundwater supplies or 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 (e.g., the production rate of pre-existing nearby wells would drop to a level which would not support existing land uses or planned uses for which permits have been granted).

3) Substantially alter the existing drainage pattern of the site or area, including through the alteration of the course of a stream or river, in a manner which would result in substantial erosion or siltation on- or off-site.

4) Substantially alter the existing drainage pattern of the site or area, including through the alteration of the course of a stream or river, or substantially increase the rate or amount of surface runoff in a manner which would result in flooding on- or off-site.

5) Create or contribute runoff water which would exceed the capacity of existing or planned stormwater drainage systems or provide substantial additional sources of polluted runoff.

6) Otherwise substantially degrade water quality.

7) Place housing within a 100-year flood hazard area as mapped on a federal Flood Hazard Boundary or Flood Insurance Rate Map or other flood hazard delineation map.

8) Place within a 100-year flood hazard area structure which would impede or redirect flood flows.

9) Expose people or structures to a significant risk of loss, injury or death involving flooding, including flooding as a result of the failure of a levee or dam.

10) Inundation by seiche, tsunami, or mudflow.

In addition, based on recent state legislation (Senate Bill 5), the proposed City of Pinole General Plan would result in a significant impact to hydrology if it would result in future development within areas that do not have a minimum 200-year flood protection. Note that issues relating to water supply (item b) are discussed further in Section 4.12, Public Services and Utilities.

METHODOLOGY

The hydrology and flood potential analysis is based on a review of published information, reports, and plans regarding regional hydrology, climate, geology, water quality, and regulations. Relevant documents include the Pinole Creek Watershed Sediment Source Assessment (SFEI, 2005), Contra Costa County Watershed Atlas (Contra Costa County, 2005), and the California Water Plan Update (DWR, 2009). Numerous other technical studies and reports were reviewed to aid in the analysis of the hydrology and water quality setting and impacts as a result of the City's proposed General Plan. These documents are included in the References subsection below. The analysis takes into account the type of land uses existing and proposed within the Planning Area under the proposed update to the City's General Plan. It should be noted that this section does not discuss water supplies and the ability of the City to

provide water to future development. The reader is referred to Section 4.12, Public Services and Utilities, of this Draft EIR for a discussion of water supply issues.

PROJECT IMPACTS AND MITIGATION MEASURES

Degrade Surface Water Quality (Standards of Significance 1, 3, 5, and 6)

Impact 4.9.1 Implementation of the proposed project (General Plan Update, Three Corridors Specific Plan, and Zoning Code Update) could result in the discharge of polluted runoff during construction and operation of future urban development potentially violating water quality standards or otherwise substantially degrading surface water quality. This impact is **potentially significant**.

General Plan Update

Construction Water Quality Impacts

Construction associated with subsequent development under the proposed General Plan Update would consist of grading and vegetation removal activities that could increase soil erosion rates on the areas proposed for development. Construction activities would result in the exposure of raw soil materials to the natural elements (wind, rain, etc.). In rainy periods, grading operations may impact the surface runoff by increasing the amount of silt and debris carried by runoff. Areas with uncontrolled concentrated flow would experience loss of material within the graded areas and could potentially impact downstream water quality.

Refueling and parking of construction equipment and other vehicles on-site during construction may result in spills of oil, grease, or related pollutants that may discharge into Planning Area drainages. Improper handling, storage, or disposal of fuels and materials or improper cleaning of machinery close to area waterways could cause water quality degradation. This is a **potentially significant** impact.

Operational Water Quality Impacts

Runoff from urban land uses typically contains oils, grease, fuel, antifreeze, and byproducts of combustion (such as lead, cadmium, nickel, and other metals), as well as nutrients from fertilizers and animal waste, sediment, pesticides, herbicides, and other pollutants. Also, sizable quantities of animal waste from domesticated pets (e.g., dogs, cats, and horses) contribute bacterial pollutants into surface and source waters. Precipitation during the early portion of the wet season displaces these pollutants into the stormwater runoff, resulting in high pollutant concentrations in the initial wet weather runoff. This initial runoff, containing peak pollutant levels, is referred to as the "first flush" of storm events. It is estimated that during the rainy season, the first flush of heavy metals and hydrocarbons would occur during the first inches of seasonal rainfall.

The amount and type of runoff generated by land uses in the city may be greater than that under existing conditions due to increases in impervious surfaces. There would likely be a corresponding increase in urban runoff pollutants and first flush roadway contaminants such as heavy metals, oil, grease, nutrients (i.e., nitrates and phosphates), pesticides, and herbicides from landscaped areas. These constituents may result in water quality impacts to on- and off-site drainage flows and to downstream area waterways, including Pinole Creek and San Pablo Bay. This is a **potentially significant** impact.

Furthermore, implementation of the proposed General Plan Update would result in population growth (see **Table 3.0-5**) which would result in increased generation of wastewater that must be treated and disposed. The City of Pinole Public Works Department and the West County Wastewater district provide wastewater services to the City through the use of the Pinole/Hercules Wastewater Treatment Plant located at the foot of Tennent Avenue in the City of Pinole. Both agencies dispose of all or a majority of their treated effluent in the deep water channels of the San Pablo Bay. The most common form of wastewater generated by subsequent infill-related projects anticipated under the proposed project is domestic sewage. Domestic sewage treatment is subject to San Francisco Bay Regional Water Quality Control Water Board wastewater regulations and standards. Future development projects under the proposed General Plan would not be expected to generate unique or unusual types or levels of wastewater. Proposed discharge of unique or unusual wastewater into the sewer system would require a permit from the City of Pinole. This permit would require detailed technical information and water quality data, and the City would not issue a discharge permit until it has confirmed that the treatment facilities could treat the proposed effluent. This impact is **less than significant**.

Three Corridors Specific Plan

Implementation of the proposed Three Corridors Specific Plan would consist of the revitalization of the San Pablo Avenue, Pinole Valley Road, and Appian Way corridors, which could include new development and/or redevelopment of various urban uses. The Three Corridors Specific Plan is intended to establish more housing choices and job opportunities in the city's commercial corridors. The Three Corridors Specific Plan also identifies opportunity sites for infill mixed-use development along the city's commercial corridors in close proximity to transit and other amenities. The Specific Plan areas contain approximately 300 acres of predominantly developed land. In order to accommodate the projected demand for development and invite further capital investment within the city, the Specific Plan would change land uses in order to replace single-use commercial zoning with various mixed-use zones, eliminate commercial floor area ratio (FAR) as a development constraint, increase opportunities for residential development, and increase residential density.

Therefore, implementation of the proposed Three Corridors Specific Plan would have the potential to increase development densities in portions of the Planning Area and would result in increased construction activities. However, as described above, stormwater drainage quality from construction sites and completed development sites would be protected through implementation of existing regulations. Implementation of the proposed Specific Plan would not be expected to result in any population growth beyond that projected as part of the proposed General Plan Update and therefore would not generate any additional wastewater. This impact is considered to be **less than significant**.

Zoning Code Update

The City plans to update its Zoning Code as part of the proposed General Plan Update project. These updates would involve the deletion, addition, and modification of certain zoning districts and development standards in order to make the Zoning Code consistent with the updated General Plan (see Section 3.0, Project Description, for more details). These updates would not result in any development activities beyond those analyzed for the proposed GPU. Therefore, the Zoning Code Update would have an impact similar to that for the General Plan Update as discussed above.

Proposed General Plan Policies and Actions that Address Surface Water Quality

The proposed General Plan Update incorporates the following policies and actions that provide mitigation to minimize the impacts to surface water quality.

Action HS.2.1.3 Establish land use controls for properties that abut Pinole Creek in order to minimize potential conflicts between flood, resource protection and recreational goals. This action could be accomplished by adopting a creek ordinance.

Action HS.5.3.5 Adopt a green building ordinance to reduce construction waste, improve water conservation and reduce reliance on nonrenewable resources. This ordinance should identify practices that can be employed in the design, construction and operation of projects that will protect air and water quality in Pinole.

Action HS.7.2.2 Minimize or eliminate direct connections between impervious surfaces and storm drains.

Policy HS.7.3 Reduce the transport of runoff and surface pollutants off site.

Action HS.7.3.1 Provide regular maintenance and monitoring of stormwater collection and treatment facilities to ensure that they are operating effectively.

Action HS.7.3.2 Regularly inspect commercial, industrial and public facilities to ensure proper connections to the sanitary system and avoid illicit discharge.

Policy HS.7.4 Preserve natural water bodies and drainage systems in a natural condition wherever possible.

Action HS.7.4.1 Limit disturbance of natural water bodies and drainage systems to only those activities related to public recreation and circulation or to activities designed to enhance environmental conditions.

Action HS.7.4.2 Participate in local and regional restoration projects to improve water quality in the watersheds.

Policy HS.7.5 Reduce pollutant loading in the wastewater system.

Action HS.7.5.1 Apply best management practices to sanitary sewer system discharges.

Action HS.7.5.2 Establish protocol for reducing the use of pesticides in City parks and other public spaces maintained by the City.

Policy OS.1.7 Transitional Zones. The City will condition or modify development approvals to ensure that natural transitions along the edges of different habitat types are preserved and enhanced because of their importance to wildlife. Maintain proper buffers between sensitive habitat and conflicting land uses. Habitat types of particular concern are those along the margins of riparian corridors, marshlands, and oak woodlands. Preserves and areas with special conservation status must have compatible surrounding land uses.

Action OS.1.7.1 Establish development standards that protect upland areas surrounding riparian habitat, and buffer areas adjacent to oak woodlands and other resources. These policies may include:

a. Creek setbacks;
b. Ridgeline separation; and
c. Tree protection measures.

Policy OS.1.8 Habitat Restoration. The City shall implement a re-vegetation plan which aims to identify and prioritize areas planned for habitat restoration. Areas planned for restoration may provide special-status species habitat, connectivity of wildlife corridors, transitional zones in between natural areas and incompatible land uses, or expansion of ecological functions such as flood management and water quality.

Action OS.1.8.2 Establish riparian and stream restoration programs that include erosion control measures, stream clean-up projects, and revegetation plans for denuded areas.

Policy OS.2.4 Riparian Areas and Creek Setbacks. Lands adjacent to riparian areas shall be protected as public or private permanent open space through dedication or easements. Riparian vegetation outside the setback should also be protected. Riparian areas within the City include but are not limited to: (1) Pinole Creek; (2) Catty Creek; (3) Duncan Canyon/Cole Creek; (4) Shady Draw; (5) Faria Creek; and (6) Roble Creek and shall be protected from further degradation and enhanced during review of adjacent proposed development.

Action OS.2.4.1 Continue implementing the Pinole Creek Watershed Vision Plan and pursue related riparian and stream restoration programs.

Action OS.2.4.2 Establish minimum separation between creeks and adjoining development.

Policy OS.2.7 Integrated Creek Management. The City will encourage and cooperate with Contra Costa County and other responsible agencies to plan and implement an integrated management plan for the long-term conservation and restoration of the riparian corridor along the Pinole Creek.

Action OS.3.6.1 Continue to employ mitigations to reduce potential impacts to wetland resources to a less than significant level.

Action OS.3.6.2 Establish standards to protect wetlands resources within the City of Pinole.

Policy OS.8.2 Low Impact Development. Integrate Low Impact Development (LID) practices in all new development to reduce, treat, infiltrate and manage runoff flows caused by storms, urban runoff and impervious surfaces.

Policy OS.8.5 Prevent Water Pollution. Take actions to prevent water pollution, consistent with federal and state water policies and standards.

Policy OS.8.8 Protect creeks and San Pablo Bay within the Planning Area by implementing stormwater pollution-prevention activities.

ACTION OS.8.8.1 Minimize public and private use of pesticides that may harm water quality in the Pinole Creek watershed and Planning Area through education and outreach efforts.

ACTION OS.8.8.2 Implement a comprehensive municipal stormwater pollution-prevention program in compliance with requirements of the California Regional Water Quality Control Board's stormwater National Pollutant Discharge Elimination System (NPDES) permit.

Action OS.8.8.3 Avoid excessive grading and disturbance of vegetation and soils, retain native vegetation and significant trees, and maintain natural drainage patterns by requiring proposed development to conform to natural land forms, where feasible.

Action OS.8.8.4 Continue to work cooperatively with other agencies and community groups to comply with water quality regulations, reduce pollutants in runoff, and protect and enhance water resources in the Pinole Creek watershed and the Planning Area.

Action OS.8.8.5 Reduce directly connected impervious area by limiting the overall coverage of paving and roofs, directing runoff from impervious areas to adjacent pervious areas, and selecting permeable pavements and surface treatments to enhance water quality.

Action OS.8.8.6 Require new development projects to incorporate facilities and measures to treat stormwater before discharge from the site. The facilities shall be included in required Stormwater Control Plans and sized to meet NPDES permit requirements. Projects shall protect water quality by incorporating Low Impact Development (LID) design to detain, treat and infiltrate runoff by minimizing impervious area; such as use of pervious pavements and green roofs; disperse runoff to landscaped areas; and/or route runoff to rain gardens, cisterns, swales, and other small-scale facilities distributed throughout the project area.

Action OS.8.8.7 Support and participate in regional efforts to protect water quality and enhance recreation opportunities by preserving and restoring riparian and wetland habitat within the Planning Area and the Pinole Creek watershed.

Action SE.9.1.4 Continue to comply with state and county C.3 requirements of limiting impervious surface area and reducing stormwater runoff and work to increase Low Impact Development throughout the City.

Action SE.9.1.5 Continue to plan and implement upgrades or other options to improve solids processing, comply with permit requirements and help prevent overflow and runoff into the Bay.

Action SE.9.1.7 Continue to require new development applicants to incorporate post-construction stormwater treatment systems and best management practices on the site.

Action SE.9.1.8 Require that stormwater treatment measures use Low Impact Development systems such as vegetation to treat pollutants in stormwater runoff (e.g., through rain gardens, bioretention areas and living roof systems).

In addition, Guideline 7.3.10.a, of the Three Corridors Specific Plan encourages the reduction of surface water and pollutant runoff by maximizing the use of pervious surfaces and vegetative ground cover. These guidelines also encourage the integration of natural topography into site design and the minimization of grading. . Guideline 8.2.1.k encourages parking lots to integrate landscaped swales, natural vegetation, and permeable paving to reduce surface water and pollutant runoff.

The State Water Resources Control Board is responsible for implementing elements of the Clean Water Act and has issued a statewide General Permit (Water Quality Order 99-08- DWQ) for construction activities within the state. The State General Construction Activity Storm Water Permit is implemented and enforced by regional water quality control boards and applies to construction activities that disturb 1 acre or more. This permit also requires the preparation and implementation of a stormwater pollution prevention plan that identifies best management practices (BMPs) to minimize pollutants from discharging from construction sites to the maximum extent practicable. BMPs are effective, practical, structural or nonstructural methods which prevent or reduce the movement of sediment, nutrients, pesticides, and other pollutants from the land to surface water or groundwater, or which otherwise protect water quality from potential adverse effects of development activities. The adoption and use of BMPs will provide the mechanism for reducing the volume of surface runoff originating from an area of development disturbance and running directly into surface water. Standard BMPs are available in the California Stormwater Quality Association handbooks (CSQA, 2003).

The Pinole Municipal Code requires that every application for a development project, including but not limited to a rezoning, tentative map, parcel map, conditional use permit, variance, site development permit, design review, or building permit, that is subject to the development runoff requirements in the City's National Pollutant Discharge Elimination System (NPDES) permit must be accompanied by a stormwater control plan that meets the criteria in the most recent version of the Contra Costa Clean Water Program (Section 8.20.050, Stormwater Control Plan). (The San Francisco Bay Regional Water Quality Control Water Board first issued a municipal stormwater NPDES permit to Contra Costa County and its 19 cities and towns, including the City of Pinole, in 1993.)

Section 8.20.090 states that all construction contractors performing work in the city shall conform to the requirements of the BMPs for construction activities, new development, and redevelopment required by the City and the Association of Bay Area Governments *Manual of Standards for Erosion and Sediment Control Measures*. As a minimum, such BMPs must include provision for filter materials placed to preclude an increase in debris and sediments entering the stormwater system over "non-project" conditions. The City Engineer may establish controls on the volume and rate of stormwater runoff from new developments and redevelopment as may be appropriate to minimize the discharge and transport of pollutants. Section 8.20.090 was enacted by the City for the purpose of regulating grading on all property within the city to avoid pollution of watercourses with nutrients, sediments, or other earthen materials generated or caused by surface runoff on or across the permit area. Additionally, the release of non-stormwater discharges to the City's stormwater system is prohibited (Section 8.20.060, Discharge of Non-Stormwater).

As part of the City's coverage under the General Permit for the NPDES Phase II Regulations, the City complies with the Contra Costa Clean Water Program *Stormwater C.3 Guidebook* in the

City Municipal Code in order to protect water quality. BMPs under this program include street sweeping, maintenance of storm drains, identification and elimination of illicit discharges to storm drains, business inspections, public outreach, construction site inspections, monitoring and studies of stream health, and control of runoff pollutants from new developments and redevelopments. Section 8.20.090 of the City Municipal Code requires that any person owning or operating premises that may contribute pollutants to the City's stormwater system undertake all practicable BMPs to reduce the potential for pollutants entering the system. Examples of such premises include, but are not limited to, parking lots, gasoline stations, industrial facilities, and other commercial enterprises.

Additionally, the Contra Costa Clean Water Program *Stormwater C.3 Guidebook* has created a Low Impact Development (LID) approach that ensures consistent and thorough implementation of the San Francisco Bay Regional Water Quality Control Water Board's requirements. Many stormwater controls, including LID, have proven to be practicable in most development projects. To achieve fair and effective implementation, criteria and guidance for those controls must be detailed and specific — while also offering the right amount of flexibility or exceptions for special cases. The NPDES permit includes various standards, including hydrologic criteria, which have been found to comprise the "maximum extent practicable." The *Stormwater C.3 Guidebook* is continuously improved and refined based on the experience of municipal planners and engineers, with input from land developers and development professionals.

Implementation of the proposed General Plan policies and actions and Specific Plan guidelines listed above, as well as continued compliance with the State General Construction Activity Storm Water Permit requirements (where applicable), the City's Municipal Code (Sections 8.20.040 through 8.20.210), and the Contra Costa Clean Water Program *Stormwater C.3 Guidebook* would significantly reduce surface water quality impacts associated with implementation of the proposed project. Specifically, this impact would be lessened through the use of effective construction-phase, source control, and treatment control BMPs and Low Impact Development systems that include site preparation, runoff control, sediment retention, and other similar features. The effectiveness of BMPs has been recognized in the California Stormwater Quality Association, Stormwater Best Management Practice Handbooks. The Low Impact Development approach ensures consistent and thorough implementation of the San Francisco Bay Regional Water Quality Control Water Board's requirements. However, this impact remains **potentially significant**.

Mitigation Measures

MM 4.9.1 General Plan Action HS.2.1.3 shall be revised as follows:

> Establish land use controls for properties that abut Pinole Creek in order to minimize potential conflicts between flood, resource protection and recreational goals. Adopt new development regulations that require applications for new development projects to adhere to pertinent local, state, and federal agency requirements. City Development regulation for properties that abut the Creek shall specify appropriate land uses and ensure that new projects will take into account issues including flow velocity, sediment load, and volume within Pinole Creek.

After implementation of mitigation measure **MM 4.9.1**, surface water quality impacts associated with implementation of the proposed project would be reduced to a **less than significant** level.

Degrade Groundwater Quality (Standards of Significance 1, and 6)

Impact 4.9.2 Implementation of the proposed project (General Plan Update, Three Corridors Specific Plan, and Zoning Code Update) could result in the degradation of groundwater quality resulting from construction and operation of future urban development. This is considered a **less than significant** impact.

General Plan Update

As discussed above in **Impact 4.9.1**, development of the Planning Area under the proposed General Plan Update could generate runoff containing oils, grease, fuel, antifreeze, byproducts of combustion (such as lead, cadmium, nickel, and other metals), household pollutants, nutrients (i.e., fertilizers), and other chemicals from landscaped areas. The sub-surface water gradient in the Planning Area is considered most vulnerable to the following activities associated with contaminants detected in the water supply: sewer collection systems, parks, RV parks, fertilizer and pesticide application, automobile body and repair shops, utility stations (maintenance areas), railroad yards (maintenance/fueling areas), chemical/petroleum processing/storage, machine shops, and fleet/truck/bus terminals. This impact is **potentially significant**.

Three Corridors Specific Plan

Implementation of the proposed Three Corridors Specific Plan would consist of the revitalization of the San Pablo Avenue, Pinole Valley Road, and Appian Way corridors, which could include new development and/or redevelopment of various urban uses. The Three Corridors Specific Plan is intended to establish more housing choices and job opportunities in the city's commercial corridors. The Three Corridors Specific Plan also identifies opportunity sites for infill mixed-use development along the city's commercial corridors in close proximity to transit and other amenities. The Specific Plan areas contain approximately 300 acres of predominantly developed land. In order to accommodate the projected demand for development and invite further capital investment within the city, the Specific Plan would change land uses in order to replace single-use commercial zoning with various mixed-use zones, eliminate commercial floor area ratio (FAR) as a development constraint, increase opportunities for residential development, and increase residential density.

Implementation of the proposed Three Corridors Specific Plan would result in increased intensity of development within portions of the Planning Area, potentially resulting in increased urban runoff containing various pollutants that could degrade groundwater quality. As such, this impact is **potentially significant**.

Zoning Code Update

The City plans to update its Zoning Code as part of the proposed General Plan Update project. These updates would involve the deletion, addition, and modification of certain zoning districts and development standards in order to make the Zoning Code consistent with the updated General Plan (see Section 3.0, Project Description, for more details). These updates would result in any development activities beyond those analyzed for the proposed GPU. Therefore, the Zoning Code Update would have an impact similar to that for the General Plan Update as discussed above.

Proposed General Plan Policies and Actions that Address Groundwater Quality

The proposed General Plan Update incorporates the following policies and actions that provide mitigation to minimize the impacts to groundwater quality.

Policy OS.8.4 Groundwater Quality. Collaborate with local and regional water resource managers to identify and monitor areas where hazardous waste and other pollutants may negatively impact groundwater quality.

Action OS.8.4.1 Groundwater Quality Protection. Require appropriately designated filters adjacent to all manmade storm drainage channels.

Policy OS.8.5 Prevent Water Pollution. Take actions to prevent water pollution, consistent with federal and state water policies and standards.

Action OS.8.8.1 Minimize public and private use of pesticides that may harm water quality in the Pinole Creek watershed and Planning Area through education and outreach efforts.

Action OS.8.8.2 Implement a comprehensive municipal stormwater pollution-prevention program in compliance with requirements of the California Regional Water Quality Control Board's stormwater National Pollutant Discharge Elimination System (NPDES) permit.

Action OS.8.8.6 Require new development projects to incorporate facilities and measures to treat stormwater before discharge from the site. The facilities shall be included in required Stormwater Control Plans and sized to meet NPDES permit requirements. Projects shall protect water quality by incorporating Low Impact Development (LID) design to detain, treat and infiltrate runoff by minimizing impervious area; such as use of pervious pavements and green roofs; dispersing runoff to landscaped areas; and/or routing runoff to rain gardens, cisterns, swales, and other small-scale facilities distributed throughout the project area.

Action OS.8.8.7 Support and participate in regional efforts to protect water quality and enhance recreation opportunities by preserving and restoring riparian and wetland habitat within the Planning Area and the Pinole Creek watershed.

Action SE.9.1.8 Require that stormwater treatment measures use Low Impact Development systems such as vegetation to treat pollutants in stormwater runoff (e.g., through rain gardens, bioretention areas and living roof systems).

In addition, Guideline 7.3.10.a, of the Three Corridors Specific Plan encourages the reduction of surface water and pollutant runoff by maximizing the use of pervious surfaces and vegetative ground cover. These guidelines also encourage the integration of natural topography into site design and the minimization of grading. . Guideline 8.2.1.k encourages parking lots to integrate landscaped swales, natural vegetation, and permeable paving to reduce surface water and pollutant runoff.

As part of Phase II of the NPDES, the State Water Resources Control Board has adopted a General Permit for the Discharge of Storm Water from Small MS4s to provide permit coverage for smaller municipalities, which the City complies with through implementation of the Contra Costa

Clean Water Program *Stormwater C.3 Guidebook* described under Impact 4.9.1 above, which provides water quality protections for surface water and groundwater.

In addition, Pinole Municipal Code Section 8.20.090 states that for each new development and redevelopment project subject to the development runoff requirements, every applicant will submit a stormwater control plan and implement conditions of approval that reduce stormwater pollutant discharges through the construction, operation, and maintenance of treatment measures and other appropriate source control and site design measures (e.g., stormwater detention/infiltration basins, storm drains). Similarly, increases in runoff volume and flows must be managed in accordance with the development runoff requirements. The California Stormwater Quality Association has prepared technical studies regarding water quality control feature impacts on groundwater in the Stormwater Best Management Practices Handbooks. These studies have identified that water quality control features such as infiltration basins (when inspected and monitored properly) have been successful in controlling water quality and avoiding groundwater quality impacts (metals and organic compounds associated with stormwater are typically lost within the first few feet of the soil of the basins).

Implementation of the SWRCB's statewide General Permits for construction and dewatering (Water Quality Orders 99-08-DWQ and R5-2008-0081) would minimize degradation of storm drainage leaving construction sites. In addition, implementation of the Contra Costa Clean Water Program, as referenced in the City Municipal Code, would protect stormwater quality from pollutants associated with normal operation of urban development once developed. Furthermore, proposed Action OS.8.5.1 requires appropriately designated filters adjacent to all man-made storm drainage channels. Treated effluent from the City's wastewater service providers is disposed in San Pablo Bay and would have no effect on the underlying groundwater. Therefore, this impact would be mitigated to a **less than significant** level.

Mitigation Measures

None required.

Deplete Groundwater Supplies or Interfere with Groundwater Recharge (Standard of Significance 2)

Impact 4.9.3 Implementation of the proposed project (General Plan Update, Three Corridors Specific Plan, and Zoning Code Update) would not require the use of any groundwater supplies. There would be **no impact**.

General Plan Update

The City of Pinole is provided municipal water service by the East Bay Municipal Utilities District (EBMUD). EBMUD obtains water from the Mokelumne River watershed and from local area watersheds. Most of the water in the Mokelumne River watershed is from snowmelt from the Sierra Nevada mountain range. Water acquired form local area watersheds is primarily from runoff and precipitation that collects in several reservoirs maintained by EBMUD. No water is obtained from groundwater resources. Additionally, the Planning Area and surrounding region do not have significant underlying groundwater resources and are not located within a recognized groundwater subbasin (DWR, 2003). Therefore, implementation of the proposed project would have **no impact** on groundwater supplies nor would it interfere with the recharge of a groundwater aquifer.

Three Corridors Specific Plan

Implementation of the proposed Three Corridors Specific Plan would consist of the revitalization of the San Pablo Avenue, Pinole Valley Road, and Appian Way corridors, which could include new development and/or redevelopment of various urban uses. The Three Corridors Specific Plan is intended to establish more housing choices and job opportunities in the city's commercial corridors. The Three Corridors Specific Plan also identifies opportunity sites for infill mixed-use development along the city's commercial corridors in close proximity to transit and other amenities. The Specific Plan areas contain approximately 300 acres of predominantly developed land. In order to accommodate the projected demand for development and invite further capital investment within the city, the Specific Plan would change land uses in order to replace single-use commercial zoning with various mixed-use zones, eliminate commercial floor area ratio (FAR) as a development constraint, increase opportunities for residential development, and increase residential density.

As described above, the City of Pinole is provided municipal water service by EBMUD, and EBMUD obtains water from the Mokelumne River watershed and from local area watersheds. No water is obtained from groundwater resources. As such, the proposed Specific Plan would have **no impact**.

Zoning Code Update

The City plans to update its Zoning Code as part of the proposed General Plan Update project. These updates would involve the deletion, addition, and modification of certain zoning districts and development standards in order to make the Zoning Code consistent with the updated General Plan (see Section 3.0, Project Description, for more details). These updates would not result in any development activities beyond those analyzed for the proposed GPU. Therefore, the Zoning Code Update would have an impact similar to that for the General Plan Update as discussed above.

Proposed General Plan Policies and Actions that Address Depletion of Groundwater Supplies or Interference with Groundwater Recharge

As previously mentioned, the City of Pinole water supply is not obtained from groundwater resources. However, the proposed General Plan Update incorporates the following policies and actions that would assist in minimizing any potential impacts to groundwater recharge.

Action HS.7.2.1 Ensure that impervious surfaces created in new development and redevelopment is designed to optimize infiltration.

Policy OS.1.7 Transitional Zones. The City will condition or modify development approvals to ensure that natural transitions along the edges of different habitat types are preserved and enhanced because of their importance to wildlife. Maintain proper buffers between sensitive habitat and conflicting land uses. Habitat types of particular concern are those along the margins of riparian corridors, marshlands, and oak woodlands. Preserves and areas with special conservation status must have compatible surrounding land uses.

Action OS.1.7.1 Establish development standards that protect upland areas surrounding riparian habitat, and buffer areas adjacent to oak woodlands and other resources. These policies may include:

a. Creek setbacks;
b. Ridgeline separation; and
c. Tree protection measures.

Policy OS.1.8 Habitat Restoration. The City shall implement a re-vegetation plan which aims to identify and prioritize areas planned for habitat restoration. Areas planned for restoration may provide special-status species habitat, connectivity of wildlife corridors, transitional zones in between natural areas and incompatible land uses, or expansion of ecological functions such as flood management and water quality.

Action OS.1.8.2 Establish riparian and stream restoration programs that include erosion control measures, stream clean-up projects, and revegetation plans for denuded areas.

Policy OS.2.4 Riparian Areas and Creek Setbacks. Lands adjacent to riparian areas shall be protected as public or private permanent open space through dedication or easements. Riparian vegetation outside the setback should also be protected. Riparian areas within the City include but are not limited to (1) Pinole Creek; (2) Catty Creek; (3) Duncan Canyon/Cole Creek; (4) Shady Draw; (5) Faria Creek; and (6) Roble Creek and shall be protected from further degradation and enhanced during review of adjacent proposed development.

Action OS.2.4.1 Continue implementing the Pinole Creek Watershed Vision Plan and pursue related riparian and stream restoration programs.

Action OS.2.4.2 Establish minimum separation between creeks and adjoining development.

Policy OS.2.7 Integrated Creek Management. The City will encourage and cooperate with Contra Costa County and other responsible agencies to plan and implement an integrated management plan for the long-term conservation and restoration of the riparian corridor along the Pinole Creek.

Action OS.3.6.1 Continue to employ mitigations to reduce potential impacts to wetland resources to a less than significant level.

Action OS.3.6.2 Establish standards to protect wetlands resources within the City of Pinole.

Policy OS.8.2 Low Impact Development. Integrate Low Impact Development (LID) practices in all new development to reduce, treat, infiltrate and manage runoff flows caused by storms, urban runoff and impervious surfaces.

Policy OS.8.3 Groundwater Recharge. Encourage natural groundwater recharge and identify groundwater recharge opportunities to combine groundwater recharge with habitat protection and recreational land uses, as part of other conservation planning efforts such as open space and park planning and creek restoration, where appropriate.

Action OS.8.8.5 Reduce directly connected impervious area by limiting the overall coverage of paving and roofs, directing runoff from impervious areas to adjacent

pervious areas, and selecting permeable pavements and surface treatments to enhance water quality.

Action OS.8.8.6 Require new development projects to incorporate facilities and measures to treat stormwater before discharge from the site. The facilities shall be included in required Stormwater Control Plans and sized to meet NPDES permit requirements. Projects shall protect water quality by incorporating Low Impact Development (LID) design to detain, treat and infiltrate runoff by minimizing impervious area; such as use of pervious pavements and green roofs; disperse runoff to landscaped areas; and/or route runoff to rain gardens, cisterns, swales, and other small-scale facilities distributed throughout the project area.

Action SE.9.1.4 Continue to comply with state and county C.3 requirements of limiting impervious surface area and reducing stormwater runoff and work to increase Low Impact Development throughout the City.

Action SE.9.1.8 Require that stormwater treatment measures use Low Impact Development systems such as vegetation to treat pollutants in stormwater runoff (e.g., through rain gardens, bioretention areas and living roof systems).

In addition, guidelines in Chapter 7.0, *Private Realm Standards and Design Guidelines*, and Chapter 8.0, *Public Realm Standards and Design Guidelines*, of the Three Corridors Specific Plan encourage the use of native, drought-tolerant species in landscaping designs as well as the limiting of turf, the use of custom irrigation systems that conserve water, and the use of recycled water to reduce water consumption. The reader is also referred to Chapter 9.0, *Infrastructure and Public Facilities*, of the Specific Plan, which confirms that new development must "pay for itself." Therefore, if new development proposed within the Specific Plan Area causes an increased demand on the system, the developer would be responsible for paying for the necessary system improvements (new distribution pipelines, water supply or storage) in order to meet the increased demand and/or higher flow requirements..

As previously mentioned, EBMUD has identified increased water storage in groundwater aquifers as a potential future alternative water supply to meet demands in dry periods. This project, referred to as the Bayside Groundwater Project, involves groundwater injection/extraction operations in the San Leandro/San Lorenzo area, several miles south of the Planning Area (EBMUD, 2005). Phase 1 of this project will store an annual average of one million gallons a day (mgd) (1,120 acre-feet) of water in a deep aquifer beneath San Lorenzo (EBMUD, 2010). Water stored in wet years would supply customers in dry years at a delivery rate that does not exceed 1 mgd on a yearly average. The environmental impact report prepared for the Bayside Groundwater Project was approved by the EBMUD Board of Directors in November 2005 and at the time of this analysis the project had nearly reached completion. After the successful completion of Phase 1, EBMUD will consider a larger Phase 2 Bayside Groundwater Project that would store 2 to 10 mgd, providing even greater drought protection. A new EIR would be prepared prior to EBMUD proceeding with Phase 2.

The Planning Area and surrounding region do not have significant underlying groundwater resources and are not located within a recognized groundwater subbasin (DWR, 2003). Implementation of the proposed project would have **no impact** on groundwater supplies nor would it interfere with the recharge of a groundwater aquifer.

Mitigation Measures

None required.

Increase Storm Runoff and Drainage Impacts (Standards of Significance 4 and 9)

Impact 4.9.4 Implementation of the proposed project (General Plan Update, Three Corridors Specific Plan, and Zoning Code Update) would increase impervious surfaces and alter drainage conditions and rates in the Planning Area, which could result in increased runoff and potential flooding impacts. This impact is considered to be **less than significant**.

General Plan Update

When land is in a natural or undeveloped condition, soils, mulch, vegetation, and plant roots slow the movement of stormwater and increase the ability of rainwater to be absorbed, or infiltrate, thus reducing the amount of total stormwater runoff from a site. The infiltration and runoff process is altered when a site is developed with urban uses. Urban development often includes grading activities and results in the addition of impervious surfaces, including roads, parking lots, driveways, and rooftops. As a result of development, more precipitation runs off of a site as stormwater rather than infiltrating the soil as groundwater, ultimately increasing the rate or amount of stormwater, which may result in flooding.

Section 8.20.050, Stormwater Control Plan, of the City Municipal Code states that every application for a development project of 1 acre or more in size shall be accompanied by a stormwater control plan that meets the criteria in the most recent version of the Contra Costa Clean Water Program *Stormwater C.3 Guidebook*. Guidebook stormwater regulations require that new development projects incorporate features that control stormwater runoff to reduce the quantity of pollutants introduced into the storm drain system and waterways. These features are designed to slow the rate of stormwater flow. Subsequent projects under the proposed General Plan Update creating and/or replacing at least 1 acre (43,560 square feet) of impervious surface must design stormwater management facilities to provide flow control functions in order to maintain pre-project runoff volumes and durations. In addition to treating stormwater runoff, these projects control the volume and rate at which runoff is released. This impact is **less than significant.**

Three Corridors Specific Plan

Implementation of the proposed Three Corridors Specific Plan would consist of the revitalization of the San Pablo Avenue, Pinole Valley Road, and Appian Way corridors, which could include new development and/or redevelopment of various urban uses. The Three Corridors Specific Plan is intended to establish more housing choices and job opportunities in the city's commercial corridors. The Three Corridors Specific Plan also identifies opportunity sites for infill mixed-use development along the city's commercial corridors in close proximity to transit and other amenities. The Specific Plan areas contain approximately 300 acres of predominantly developed land. In order to accommodate the projected demand for development and invite further capital investment within the city, the Specific Plan would change land uses in order to replace single-use commercial zoning with various mixed-use zones, eliminate commercial floor area ratio (FAR) as a development constraint, increase opportunities for residential development, and increase residential density.

As such, implementation of the proposed Three Corridors Specific Plan would result in increased density and the addition of impervious surfaces in portions of the Planning Area. However, as described above, stormwater drainage flows would be regulated through implementation of existing regulations. As such, this impact is considered to be **less than significant**.

Zoning Code Update

The City plans to update its Zoning Code as part of the proposed General Plan Update project. These updates would involve the deletion, addition, and modification of certain zoning districts and development standards in order to make the Zoning Code consistent with the updated General Plan (see Section 3.0, Project Description, for more details). These updates would not result in any development activities beyond those analyzed for the proposed GPU. Therefore, the Zoning Code Update would have an impact similar to that for the General Plan Update as discussed above.

Proposed General Plan Policies and Actions that Address Stormwater Runoff and Drainage Impacts

The proposed General Plan Update incorporates the following policies and actions that provide mitigation to minimize storm drainage-related impacts.

Policy CS.7.1 The City will ensure that the storm drain system has adequate capacity to minimize street flooding and, where feasible, shall expand the capacity of the system to control storm flows.

Policy CS.7.2 The City will require new developments to minimize the amount of off-site drainage by retaining stormwater for on-site percolation, provide adequate drainage facilities for remaining off-site flows, maintain natural drainage channels, and avoid alteration of off-site drainage courses.

Policy CS.7.3 The City will work with the East Bay Municipal Utility District to create a flood water diversion area to reduce the potential for downstream flooding.

Action CS.7.3.1 The City will continue to work together with the East Bay Municipal Utility District and Contra Costa Flood Control District and other regional partners to develop detention basins in the upper reaches of the Pinole Creek watershed to benefit biological resources and reduce flooding hazards.

Policy CS.7.4 The City will continue implementing the Pinole Creek Vision Plan and Pinole Creek Greenway Master Plan to optimize resource protection and recreation opportunities while reducing the potential for flooding.

Action HS.2.1.3 Establish land use controls for properties that abut Pinole Creek in order to minimize potential conflicts between flood, resource protection and recreational goals. This action could be accomplished by adopting a creek ordinance.

Policy HS.2.2 Work with the Contra Costa County Flood Control District and other property owners in the Pinole Creek watershed, particularly the East Bay Municipal Utility District (EBMUD), to establish a diversion basin that could reduce stormwater flows during severe storm conditions.

Action HS.2.2.1 Establish a land use designation for land to be set aside for detention basin purposes and seek out opportunities to establish detention basins to better protect the community from flooding hazards.

Policy HS.2.3 Continue implementing a Clean Water Program to reduce surface water discharge through project design (e.g., reduce water runoff by minimizing impervious surfaces, use green areas for drainage) and to monitor compliance with the National Pollution Discharge Elimination Systems (NPDES) permit program and the Clean Water Act.

Action HS.2.5.1 Require project applicants to investigate and report on project impacts on stormwater runoff and the wastewater treatment plant and ensure that project-specific impacts are mitigated.

Action HS.2.5.2 Seek funding to upgrade facilities to reduce inflow and infiltration and treat runoff.

Action HS.7.2.1 Ensure that impervious surfaces created in new development and redevelopment is designed to optimize infiltration.

Action OS.8.8.3 Avoid excessive grading and disturbance of vegetation and soils, retain native vegetation and significant trees, and maintain natural drainage patterns by requiring proposed development to conform to natural land forms, where feasible.

Action OS.8.8.5 Reduce directly connected impervious area by limiting the overall coverage of paving and roofs, directing runoff from impervious areas to adjacent pervious areas, and selecting permeable pavements and surface treatments to enhance water quality.

Action OS.8.8.6 Require new development projects to incorporate facilities and measures to treat stormwater before discharge from the site. The facilities shall be included in required Stormwater Control Plans and sized to meet NPDES permit requirements. Projects shall protect water quality by incorporating Low Impact Development (LID) design to detain, treat and infiltrate runoff by minimizing impervious area; such as use of pervious pavements and green roofs; disperse runoff to landscaped areas; and/or route runoff to rain gardens, cisterns, swales, and other small-scale facilities distributed throughout the project area.

Action SE.9.1.4 Continue to comply with state and county C.3 requirements of limiting impervious surface area and reducing stormwater runoff and work to increase Low Impact Development throughout the City.

In addition, Guideline 7.3.10.a, of the Three Corridors Specific Plan encourages the reduction of surface water runoff by maximizing the use of pervious surfaces and vegetative ground cover. Guideline 8.2.1.k encourages parking lots to integrate landscaped swales, natural vegetation, and permeable paving to reduce surface water runoff.

Implementation of the proposed General Plan update policies and actions items and Specific Plan guidelines listed above, and mitigation measure **MM 4.9.1**, as well as continued adherence

to the objectives of Section 8.20.050 of the Pinole Municipal Code, would reduce this impact to **less than significant**.

Mitigation Measures

None required.

Stormwater Drainage System Impacts (Standards of Significance 4)

Impact 4.9.5 Implementation of the proposed project (General Plan Update, Three Corridors Specific Plan, and Zoning Code Update) and its associated project components could create or contribute stormwater runoff water which would exceed the capacity of the City's stormwater drainage system. This impact is considered to be **less than significant**.

General Plan Update

Implementation of the proposed General Plan Update Land Use Map and policies would allow for land uses that would increase impervious surfaces and increase stormwater runoff rates in the Planning Area. Increased stormwater runoff would need to be conveyed in Pinole's stormwater drainage system, which is maintained by the City. The existing storm drain collection system extends throughout the city as shown in **Figure 4.9-3**. New or expanded stormwater drainage infrastructure could be required in order to adequately accommodate increased runoff resulting from future land uses developed under the General Plan Update. Possible upgrades include the construction of more storm drains, construction of detention basins, creation of overland release pads, additional drainage pipelines, and upsizing of drainage pipes.

The City's 2009–2014 Capital Improvements Program (CIP) describes planned citywide public improvement projects for Fiscal Years 2009–2014, including storm drains. The 2009–2014 CIP plans for the creation of a Storm Drain Master Plan, as well as necessary storm drain improvements. Furthermore, future development or redevelopment projects proposed under the General Plan Update would involve an analysis of impacts to the storm drainage system due to higher-intensity land uses. If upgrades to the existing drainage system are necessary, such improvements would be required to be in compliance with the City of Pinole Drainage Improvement Standards.

The construction of new stormwater drainage infrastructure or the expansion of existing stormwater drainage infrastructure could result in physical effects to the environment. The provision of such facilities within the Planning Area has been programmatically considered in the technical analysis provided in this DEIR associated with urbanization of the Planning Area. Future stormwater drainage facilities would be subject to project-level CEQA review at such time as they are proposed.

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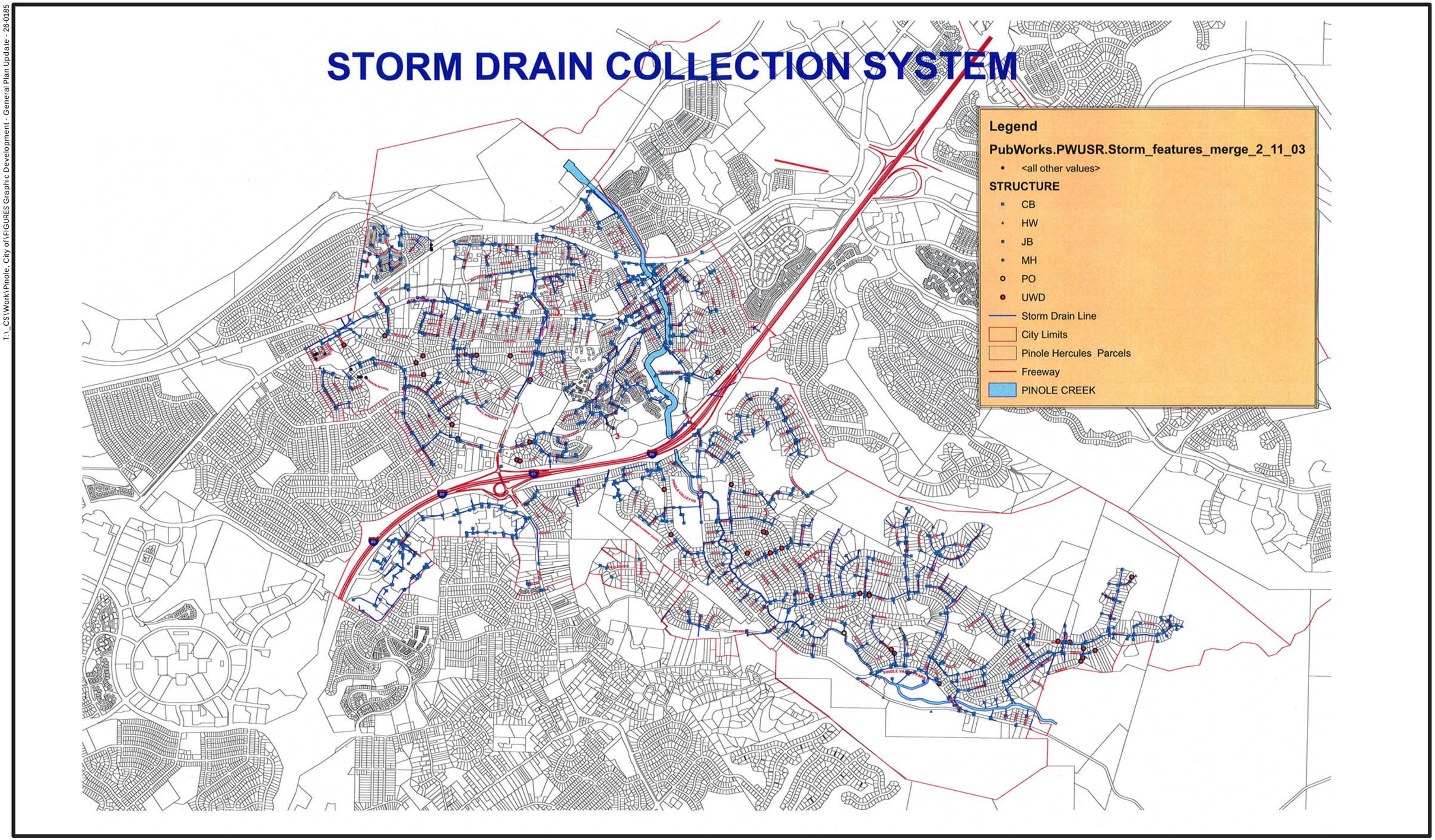

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Figure 4.9-3
City of Pinole - Storm Drain Collection System

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Three Corridors Specific Plan

Implementation of the proposed Three Corridors Specific Plan would consist of the revitalization of the San Pablo Avenue, Pinole Valley Road, and Appian Way corridors, which could include new development and/or redevelopment of various urban uses. The Three Corridors Specific Plan is intended to establish more housing choices and job opportunities in the city's commercial corridors. The Three Corridors Specific Plan also identifies opportunity sites for infill mixed-use development along the city's commercial corridors in close proximity to transit and other amenities. The Specific Plan areas contain approximately 300 acres of predominantly developed land. In order to accommodate the projected demand for development and invite further capital investment within the city, the Specific Plan would change land uses in order to replace single-use commercial zoning with various mixed-use zones, eliminate commercial floor area ratio (FAR) as a development constraint, increase opportunities for residential development, and increase residential density.

As the Three Corridors Specific Plan implements the proposed General Plan, redevelopment and infrastructure activities in the corridors would not result in any stormwater drainage system impacts beyond those analyzed for the proposed General Plan Update. Therefore, this impact is **less than significant**.

Zoning Code Update

The City plans to update its Zoning Code as part of the proposed General Plan Update project. These updates would involve the deletion, addition, and modification of certain zoning districts and development standards in order to make the Zoning Code consistent with the updated General Plan (see Section 3.0, Project Description, for more details). These updates would not result in any development activities beyond those analyzed for the proposed GPU. Therefore, the Zoning Code Update would have an impact similar to that for the General Plan Update as discussed above.

Proposed General Plan Policies and Actions that Address Stormwater Drainage System Impacts

The proposed General Plan incorporates the following policies and actions that provide mitigation to minimize impacts associated with the need for additional stormwater drainage system infrastructure.

Policy CS.7.1 The City will ensure that the storm drain system has adequate capacity to minimize street flooding and, where feasible, shall expand the capacity of the system to control storm flows.

Policy CS.7.2 The City will require new developments to minimize the amount of off-site drainage by retaining stormwater for on-site percolation, provide adequate drainage facilities for remaining off-site flows, maintain natural drainage channels, and avoid alteration of off-site drainage courses.

Action SE.9.1.4 Continue to comply with state and county C.3 requirements of limiting impervious surface area and reducing stormwater runoff and work to increase Low Impact Development throughout the City.

Action SE.9.1.7 Continue to require new development applicants to incorporate post-construction stormwater treatment systems and best management practices on the site.

Action SE.9.1.8 Require that stormwater treatment measures use Low Impact Development systems such as vegetation to treat pollutants in stormwater runoff (e.g., through rain gardens, bioretention areas and living roof systems)

In addition, Chapter 9.0, *Infrastructure and Public Facilities*, of the Specific Plan further addresses storm drainage in the Specific Plan area, including planned capitol improvements that may further reduce this impact. The Specific Plan notes that any changes in land use or redevelopment will require an evaluation of the existing drainage system to check for adequacy. If upgrades to the existing drainage structures are necessary, they would have to be in compliance with City of Pinole Drainage Improvement Standards.

The proposed General Plan Update Policy CS.7.1 would ensure that the storm drain system has adequate capacity to minimize street flooding and that the City would expand the capacity of the system to control storm flows. The provision of such facilities within the Planning Area has been programmatically considered in the technical analysis provided in this DEIR, and future stormwater drainage facilities would be subject to project-level CEQA review at such time as they are proposed. Therefore, impacts would be considered **less than significant**.

Mitigation Measures

None required.

Flooding Hazards (Standards of Significance 7, 8, 9 and 10)

Impact 4.9.6 Implementation of the proposed project (General Plan Update, Three Corridors Specific Plan, and Zoning Code Update) could result in the development of urban uses within areas subject to flooding, dam failure inundation, and/or sea level rise. This impact is considered to be **potentially significant**.

General Plan Update

The Planning Area contains both natural waterways and man-made features (e.g., channels, storm drain inlets, siphons, overchutes, v-ditches, detention basins) that convey drainage. Drainage primarily flows in an east to west direction into the Pinole Creek watershed and eventually into San Pablo Bay.

Flooding

Flood hazards arise from natural rainstorms, failure of water storage facilities, and secondary effects of landslides. As previously mentioned, a large portion of the Planning Area is designated by FEMA as Zone X. Zone X is defined as areas outside the 1 percent annual chance floodplain, or 100-year floodplain, and is considered to be at moderate to low risk of flooding. However, the entire Pinole Creek corridor and the majority of the San Pablo Bay shoreline are designated by FEMA as being within the 100-year floodplain. In addition, portions of the Pinole Creek corridor are located within the 500-year floodplain (see **Figure 4.9-2**). There is potential for Pinole Creek to flood. However, the risk of flooding in Pinole is considered minimal (City of Pinole, 2009).

Areas that are susceptible to localized flooding within the city include the Pinole/Hercules Water Pollution Control Plant (WPCP) and the freeway underpass at Interstate 80 and Pinole Valley Road. The WPCP is impacted by flooding of the creek when tidal surge and heavy rain runoff occurs (City of Pinole, 2009). The ability for the WPCP to vent/drain is hampered by these

conditions. Flooding is also caused along Pinole Creek when the creek bed is littered with debris. During heavy rains the debris is gathered into natural dams, providing the opportunity for debris plugs adversely affecting the creek's normal flow. The backup created by debris flows then causes the water to flow over and around the infrastructure designed to accommodate the normal runoff of water. During heavy rains when the storm drains are clogged with debris, there is also the potential for the freeway underpass at Interstate 80 and Pinole Valley Road to flood (City of Pinole, 2009). Flooding within Pinole occurs infrequently and when it does occur, it is gradual and generally not life-threatening from flooding directly.

Chapter 15.48, Floodplain Hazard Reduction, of the City Municipal Code recognizes that there are flood hazard areas in Pinole which are subject to periodic flooding. Chapter 15.48 promotes the public health, safety, and general welfare and seeks to minimize public and private losses due to flood conditions by restricting or prohibiting uses which are dangerous to health, safety, and property due to water or erosion hazards or which result in damaging increases in erosion or flood heights or velocities. Furthermore, Chapter 15.48 requires that uses vulnerable to floods, including facilities which serve such uses, be protected against flood damage at the time of initial construction and regulates the alteration of natural floodplains, stream channels, and natural protective barriers which help accommodate or channel floodwaters. Chapter 15.48 regulates filling, grading, dredging, and other development which may increase flood damage and prevents or regulates the construction of flood barriers which will unnaturally divert floodwaters or which may increase flood hazards in other areas.

The Pinole Creek Watershed Vision Plan includes a proposed lower flood control channel restoration project that aims to improve creek habitat while providing flood protection. With funding from the Coastal Conservancy, the Urban Creeks Council, Pinole Redevelopment Agency, Contra Costa Flood Control District, and Friends of Pinole Creek Watershed partnered to develop two plans. One plan is a broad-based vision for the entire watershed; the other is a restoration concept for the Pinole Creek flood control channel (from Interstate 80 to San Pablo Bay). The Vision Plan was developed through a consensus-based community process and included the participation of a diverse set of stakeholders throughout the watershed. The flood control channel restoration design will be submitted to the U.S. Army Corps of Engineers for potential implementation under the Section 1135 program, which allows the USACE to revisit and restore prior projects that have had detrimental resource impacts.

Flood-related emergency situations are reported to the Office of Emergency Services (OES) Mutual Aid Region Office in Martinez. The City of Pinole Fire Department's Emergency Operations Plan addresses flooding in the city. The plan was updated and adopted in May 2006. This impact is **less than significant**.

Dam Failure Inundation

Dam safety is regulated by the State Department of Water Resources, Division of Safety and Dams. All large reservoirs in Contra Costa County have been investigated and many have been strengthened (Contra Costa County, 2005).

The Public Works Department and County Flood Control maintain an inundation map of Pinole that includes the city and Contra Costa County. In addition, the Fire Department maintains checklists for specific addresses that have had recurring issues in past floods. The Emergency Operations Plan referenced above also explores the possible impacts to the City of Pinole from dam and storage tank failure. For instance, failure of Maloney Reservoir, Argyle #2 Reservoir, and Stott Water Storage Tank could result in flooding in Pinole and the vicinity, so the East Bay Municipal Utility District (EBMUD) recently made improvements to these three sites.

The City's existing Zoning Code includes a special floodplain combining district (Section 17.20.190). For instance, crop and tree farming and truck gardening and buildings and structures may be permitted without requirement for a use permit in this combining district. Continued compliance with these existing regulations reduces this impact to **less than significant**.

Sea Level Rise

Implementation of the proposed General Plan Update could expose additional people and/or structures to hazards associated with sea level rise. The hazards associated with sea level rise include inundation, increased flooding, and loss of natural wetland habitat. Additionally, reports indicate that if San Francisco Bay rises by 11.8 inches (30 cm), the 100-year storm-surge-induced flood event would be shifted to occur once every 10 years (BCDC, 2007). Bay waters have risen at the rate of 7 inches (17.78 cm) since the last century, and sporadic storms of increased strength due to climate change have created flooding and saltwater intrusion issues in the Bay Area. According to the Environmental Protection Agency as well as the National Oceanographic and Atmospheric Administration, sea level rise in the Bay Area is expected to exceed 1 meter, or more than 3 feet, by the end of this century (City of Pinole, 2009).

Pinole is situated about 31 meters, or 101 feet, above sea level. Effects felt by Pinole from a 1-meter sea level rise are likely to be minimal and largely contained to the coast of Pinole along San Pablo Bay. However, areas that are greatly threatened from a 1-meter sea level rise include the Richmond Parkway and parts of Richmond and San Pablo, as well as the West County Landfill and potentially the Pinole/Hercules Water Pollution Control Plant (see **Figure 4.9-4**). **Figure 4.9-4** illustrates an impact scenario in which sea level rises 1 meter by the year 2100. These threatened areas are interconnected to the City of Pinole and would have repercussive effects on the city if current forecasts of sea level rise hold true. This impact is **potentially significant**.

Three Corridors Specific Plan

Implementation of the proposed Three Corridors Specific Plan would consist of the revitalization of the San Pablo Avenue, Pinole Valley Road, and Appian Way corridors, which could include new development and/or redevelopment of various urban uses. The Three Corridors Specific Plan is intended to establish more housing choices and job opportunities in the city's commercial corridors. The Three Corridors Specific Plan also identifies opportunity sites for infill mixed-use development along the city's commercial corridors in close proximity to transit and other amenities. The Specific Plan areas contain approximately 300 acres of predominantly developed land. In order to accommodate the projected demand for development and invite further capital investment within the city, the Specific Plan would change land uses in order to replace single-use commercial zoning with various mixed-use zones, eliminate commercial floor area ratio (FAR) as a development constraint, increase opportunities for residential development, and increase residential density.

Implementation of the proposed Three Corridors Specific Plan would result in an increased number of residents, employees, and visitors within the Specific Plan area, potentially exposing a greater number of people to existing flood hazards including dam failure inundation. As described above, existing regulations minimize this impact to a less than significant level. However, risks associated with potential sea level rise as a result of climate change would remain a **potentially significant** impact.

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DISCLAIMER: Inundation data does not account for existing shoreline protection or wave activity. These maps are for informational purposes only. Users, by their use, agree to hold harmless and blameless the State of California and its representatives and its agents for any liability associated with its use in any form. The maps and data shall not be used to assess actual coastal hazards, insurance requirements, or property values or be used in lieu of Flood Insurance Rate Maps issued by the Federal Emergency Management Agency (FEMA).

Source: Knowles, 2008; Siegel and Bachand, 2002; NAIP 2005

Not to Scale

N

Figure 4.9-4

Shoreline Areas Vulnerable to Sea Level Rise – Year 2100

PMC®

Zoning Code Update

The City plans to update its Zoning Code as part of the proposed General Plan Update project. These updates would involve the deletion, addition, and modification of certain zoning districts and development standards in order to make the Zoning Code consistent with the updated General Plan (see Section 3.0, Project Description, for more details). These updates would not result in any development activities beyond those analyzed for the proposed GPU. Therefore, the Zoning Code Update would have an impact similar to that for the General Plan Update as discussed above.

Proposed General Plan Policies and Actions that Address Flooding Hazards

The proposed General Plan Update incorporates the following policies and actions that provide mitigation to minimize storm drainage-related impacts.

Action LU.5.3.1 Establish a creek protection ordinance to govern land use along Pinole Creek that takes into account resource and flood protection issues. Standards may be different for existing and new development. For the portion of the creek located north of Interstate 80, the protection zone should extend 50 feet outward from the centerline of the creek. For upstream parcels, the City should establish standards that respect existing development patterns, particularly where the creek is located on private property. Within this zone, riparian resource protection, public access and recreational activity should be the primary use.

Action LU.5.3.2 In areas where existing development abuts the creek, recreational use and public access adjacent to the resource are appropriate uses and activities. Where undeveloped properties abut the creek, siting and design of facilities should preserve and protect the natural resources, but public access and recreational activity are acceptable.

Policy LU.6.1 Retain the designation for the land immediately adjacent to the bay as San Pablo Bay Conservation Area, and expand the San Pablo Bay Conservation Area to include the Pinole/Hercules Water Pollution Control Plant and Bayfront Park. Primary use of the San Pablo Bay Conservation Area shall be for water-dependent uses (including water pollution control), recreation, public access, open space and resource protection. The City should formulate a plan for this area to meet the needs of connecting the Bay Trail, providing backbone facilities for the Bay Water Trail, expanding the Pinole-Hercules Water Pollution Control Plant, restoring Pinole Creek, and providing Pinole residents with waterfront uses. All proposals shall incorporate public open space and provide public access to open space areas.

Action LU.6.1.1 Establish a waterfront planning strategy to coordinate between regulatory agencies, property owners and other stakeholders to maximize recreation, public access and flood protection while ensuring continued water pollution control and creating opportunities for water-dependent uses.

Policy CS.7.1 The City will ensure that the storm drain system has adequate capacity to minimize street flooding and, where feasible, shall expand the capacity of the system to control storm flows.

Policy CS.7.2 The City will require new developments to minimize the amount of off-site drainage by retaining stormwater for on-site percolation, provide adequate drainage facilities for remaining off-site flows, maintain natural drainage channels, and avoid alteration of off-site drainage courses.

Policy CS.7.3 The City will work with the East Bay Municipal Utility District to create a flood water diversion area to reduce the potential for downstream flooding.

Action CS.7.3.1 The City will continue to work together with the East Bay Municipal Utility District and Contra Costa Flood Control District and other regional partners to develop detention basins in the upper reaches of the Pinole Creek watershed to benefit biological resources and reduce flooding hazards.

Policy CS.7.4 The City will continue implementing the Pinole Creek Vision Plan and Pinole Creek Greenway Master Plan to optimize resource protection and recreation opportunities while reducing the potential for flooding.

Action CS.7.4.1 The City will continue to work with the Contra Costa Flood Control District and other regional partners to establish a long-term funding source for Pinole Creek flood control maintenance and habitat restoration efforts.

Action HS.2.1.3 Establish land use controls for properties that abut Pinole Creek in order to minimize potential conflicts between flood, resource protection and recreational goals. This action could be accomplished by adopting a creek ordinance.

Policy HS.2.2 Work with the Contra Costa County Flood Control District and other property owners in the Pinole Creek watershed, particularly the East Bay Municipal Utility District (EBMUD), to establish a diversion basin that could reduce stormwater flows during severe storm conditions.

Action HS.2.2.1 Establish a land use designation for land to be set aside for detention basin purposes and seek out opportunities to establish detention basins to better protect the community from flooding hazards.

Policy HS.2.4 Continue to monitor studies that identify anticipated changes in sea level and create appropriate standards and improvements to minimize flood risks.

Action HS.2.4.1 Create a long-range plan to govern the San Pablo Bay waterfront and any other areas that may be impacted by changes in sea level.

Policy HS.4.1 Continue to provide essential emergency public services during natural catastrophes.

Action HS.4.1.1 Maintain and implement the Emergency Operations Plan (EOP), including periodic training exercises.

Action HS.4.1.2 Continue working with Contra Costa County and other concerned agencies to adopt a regional Emergency Response Plan (ERP).

Action HS.4.1.3 The City Fire Department staff shall review newly proposed or modified roadway designs (e.g., median modifications and speed humps) to ensure

that they do not significantly impair movement of emergency vehicles and equipment.

Action HS.4.1.4 Locate and design emergency buildings and vital utilities, communication systems and other public facilities so that they remain operational during and after an emergency or disaster.

Action HS.4.1.5 Establish an emergency warning/notification system in Pinole to notify the public during a natural or man-made disaster. Provide a public communication system to help advise the public about how best to respond during the recovery phase of a disaster and notify the community when safety has been restored.

Policy HS.4.2 Undertake disaster preparedness planning in cooperation with other public agencies and appropriate public interest organizations.

Action HS.4.2.1 Publicize disaster plans and promote resident awareness and caution regarding hazards, including soil instability, earthquakes, flooding and fire. Maintain detailed hazard maps for use in development review.

Action HS.4.2.2 Develop and adopt a pre-disaster ordinance for post-disaster recovery and reconstruction that includes provisions for debris clearance, damage assessment, demolitions, re-occupancy and building moratorium criteria, fee waivers and deferrals, and expedited permitting procedures for repair and reconstruction.

Action HS.4.2.3 Coordinate with local, regional, state and federal agencies regarding a potential rise in sea level.

Policy HS.4.3 Incorporate technological enhancements in new and substantially remodeled structures and facilities to support and improve emergency services.

Action HS.4.3.1 Develop a fiber optic network plan that can provide visual access for emergency services providers and assist with crime prevention and the monitoring of critical public facilities (e.g., storm drain and flood protection facilities).

Action HS.7.2.1 Ensure that impervious surfaces created in new development and redevelopment is designed to optimize infiltration.

Action OS.2.4.2 Establish minimum separation between creeks and adjoining development.

Policy OS.1.8 Habitat Restoration. The City shall implement a re-vegetation plan which aims to identify and prioritize areas planned for habitat restoration. Areas planned for restoration may provide special-status species habitat, connectivity of wildlife corridors, transitional zones between natural areas and incompatible land uses, or expansion of ecological functions such as flood management and water quality.

Policy OS.8.2 Integrate Low Impact Development (LID) practices in all new development to reduce, treat, infiltrate and manage runoff flows caused by storms, urban runoff and impervious surfaces.

In addition, Chapter 7.0, *Private Realm Standards and Design Guidelines*, of the Three Corridors Specific Plan encourages minimizing grading and maximizing impervious surfaces and the use of swales to reduce runoff by utilizing onsite infiltration. As discussed under Impact 4.9.5 above, Chapter 9.0, *Infrastructure and Public Facilities*, of the Specific Plan further addresses storm drainage in the Specific Plan area, including planned capitol improvements that may further reduce this impact.

Mitigation Measures

The following measures shall be incorporated into the proposed City of Pinole General Plan Update as policy and action items under Goal HS.2 in the Health and Safety Element.

MM 4.9.6a The City of Pinole shall work with the Bay Conservation and Development Commission (BCDC) to implement strategies to adapt to Bay-related impacts of climate change. The City shall work with BCDC to develop a vulnerability analyses for its shoreline and to address shoreline management issues that cross jurisdictional boundaries.

MM 4.9.6b The City will continue to implement the Municipal Code flood protection standards for development within a FEMA-designated Special Flood Hazard Area and will coordinate with FEMA and other agencies in the evaluation and mitigation of future flooding hazards that may occur as a result of sea level rise.

MM 4.9.6c The City shall pursue funding for adequate protection from sea level rise and continued subsidence and construction in areas threatened by sea level rise and/or settlement.

Implementation of the above mitigation measures regulations incorporated in the Zoning Code Update, along with the General Plan policy provisions and their associated actions, would help to reduce impacts from flooding and sea level rise in Pinole. Policy provisions for flooding and sea level rise would require new development proposals in areas subject to flooding to provide a minimum flood protection equal to a 100-year storm event and establish and maintain an effective emergency response program that anticipates the potential for disasters. Thus, implementation of the proposed General Plan Update policy provisions, and continued implementation of Municipal Code standards for flood protection, would reduce this impact to **less than significant**.

4.9.4 CUMULATIVE SETTING, IMPACTS, AND MITIGATION MEASURES

CUMULATIVE SETTING

As previously described, the GPU Planning Area is located in western Contra Costa County. Typically the cumulative hydrology and water quality analysis relates to potential issues associated with storm drainage and flooding, stormwater quality, groundwater quality (as impacted by stormwater), and exposure of structures to flood hazards. Storm drainage is an issue that is confined primarily to development in a specific area or within a specific community. Thus the cumulative setting consists of the Pinole Creek watershed and San Pablo Bay.

Development in the Pinole Creek watershed and San Pablo Bay, including the proposed and approved projects discussed in Section 4.0 of this DEIR, would change the intensity of land uses in the region. In particular, the cumulative development scenario would increase development in the western portion of Contra Costa County.

CUMULATIVE IMPACTS AND MITIGATION MEASURES

Cumulative Water Quality Impacts

Impact 4.9.7 Implementation of the proposed project (General Plan Update, Three Corridors Specific Plan, and Zoning Code Update), in combination with other development activities within the watershed, would contribute to a cumulative degradation of water quality from construction activities and increased urban runoff. This is considered a **potentially cumulatively considerable** impact.

As described under Impacts 4.9.1 and 4.9.2, subsequent infill and redevelopment proposed under the proposed project could contribute to water quality degradation from construction and operation. Cumulative development in the surrounding communities of Hercules, El Sobrante, Bayview-Montalvin, and Tara Hills could result in cumulative water quality impacts, due to their location adjacent to San Francisco Bay and Pinole Creek watershed.

All construction activities, new development, and redevelopment in the City of Pinole would be required to comply with the City's Stormwater Management and Discharge Control Ordinance (Chapter 8.20), as well as employ BMPs required by the City and the Association of Bay Area Governments *Manual of Standards for Erosion and Sediment Control Measures*, in order to prevent erosion and control of loose soil and sediment. BMPs may include placement of filter materials to prevent debris and sediments from entering the stormwater system over "non-project" conditions. Likewise, the City Engineer may impose controls on the volume and rate of stormwater runoff from new developments and redevelopment to minimize the discharge and transport of pollutants. During construction of projects in the city, the dischargers, through individual NPDES permits, must eliminate non-stormwater discharges to stormwater systems, develop and implement a stormwater pollution prevention plan, and perform monitoring of discharges to stormwater systems.

Potential impacts to water quality from construction and operation activities are addressed by the existing requirements of the City's Stormwater Management and Discharge Control Ordinance and individual NPDES permits. The policy provisions identified below would utilize BMPs, adopt a set of BMPs consistent with stormwater recommendations from the State Water Resources Control Board, and work with Contra Costa County to ensure implementation of all applicable National Pollutant Discharge Elimination System requirements. This impact is **less than cumulatively considerable**.

Proposed General Plan Policies and Actions that Address Cumulative Water Quality Impacts

The proposed General Plan update contains several goals, policies, and action items that would assist in reducing potential impacts to water quality. Policies and action items that contain specific, enforceable requirements and/or restrictions and corresponding performance standards that assist in reducing (though not eliminating) this impact are identified in the discussions for Impacts 4.9.1 and 4.9.2.

In addition, Guideline 7.3.10.a, of the Three Corridors Specific Plan encourages the reduction of surface water and pollutant runoff by maximizing the use of pervious surfaces and vegetative ground cover. These guidelines also encourage the integration of natural topography into site design and the minimization of grading. . Guideline 8.2.1.k encourages parking lots to integrate landscaped swales, natural vegetation, and permeable paving to reduce surface water and pollutant runoff.

Mitigation Measures

Implementation of policy provisions under Impacts 4.9.1 and 4.9.2 and mitigation measure MM 4.9.1, as well as the regulations incorporated in the Zoning Code Update, and compliance with the City's Stormwater Management and Discharge Control Ordinance, would reduce the City's contribution to cumulative water quality impact to a **less than cumulatively considerable** level. This impact is mitigated through the use of effective BMPs that include site preparation, runoff control, sediment retention, and other similar features. The effectiveness of BMPs has been recognized in the California Stormwater Quality Association, California Stormwater Best Management Practice Handbooks.

Cumulative Flooding Impacts

Impact 4.9.8 Implementation of the proposed project (General Plan Update, Three Corridors Specific Plan, and Zoning Code Update) could increase impervious surfaces and alter drainage conditions and rates in the Planning Area, which could contribute to cumulative flood conditions in the Pinole Creek watershed and San Pablo Bay. This impact is considered **cumulatively considerable**.

The implementation of the General Plan Update would result in infill/redevelopment in areas of the city that are located within the 100-year floodplain. Additionally, the infill/redevelopment associated with the proposed General Plan Update in combination with future development in adjacent cities within the Pinole Creek watershed could expose future residences and structures to flood hazards. As noted above, new development and redevelopment will be required to meet the City of Pinole Municipal Code standards, which mandate that uses vulnerable to floods, including facilities which serve such uses, be protected against flood damage at the time of initial construction. In addition, the Pinole Creek Watershed Vision Plan includes a proposed lower flood control channel restoration project that aims to improve creek habitat while providing flood protection. With funding from the Coastal Conservancy, the Vision Plan was developed through a consensus-based community process and included the participation of a diverse set of stakeholders throughout the watershed. The flood control channel restoration design will be submitted to the U.S. Army Corps of Engineers for potential implementation under the Section 1135 program, which allows the USACE to revisit and restore prior projects that have had detrimental resource impacts. This impact is **cumulatively considerable**.

Proposed General Plan Policies and Actions that Address Cumulative Flooding Impacts

The proposed General Plan Update contains several goals, policies, and action items that would assist in reducing potential impacts to flooding. Policies and action items that contain specific, enforceable requirements and/or restrictions and corresponding performance standards that assist in reducing (though not eliminating) this impact are identified in the discussions for Impacts 4.9.5 and 4.9.6.

In addition, Chapter 7.0, *Private Realm Standards and Design Guidelines*, of the Three Corridors Specific Plan encourages minimizing grading and maximizing impervious surfaces and the use of swales to reduce runoff by utilizing onsite infiltration. Chapter 9.0, *Infrastructure and Public Facilities*, of the Specific Plan further addresses storm drainage in the Specific Plan area, including planned capitol improvements that may further reduce cumulative flooding impacts.

Mitigation Measures

Implementation of above policy provisions and their associated actions, as well as mitigation measures from Impact 4.9.5, would help to reduce impacts from flooding and sea level rise, and drainage impacts in the City. Policy provisions for flooding and sea level rise would require new development proposals in areas subject to flooding to provide a minimum flood protection equal to a 100-year storm event and establish and maintain an effective emergency response program that anticipates the potential for disasters. Thus, implementation of the above proposed General Plan Update policy provisions, mitigation measures MM 4.9.6a through MM 4.9.6c, and continued implementation of Municipal Code standards for flood protection would reduce this impact to **less than cumulatively considerable**.

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